UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
WATER QUALITY

Kanab Creek - Use and Value Assessment and Revised Criteria for Total Dissolved Solids

3/9/20206/18/2020 6/18/2020

Draft Criteria Support Document, v. 1.3 4

EXECUTIVE SUMMARY

Kanab Creek flows for about 30 miles from its headwaters in Utah to the Arizona state border and eventually to the Colorado River. Both upper Kanab Creek, near the town of Alton, and lower, near the town of Kanab, have segments of perennial flow supported by two different base flow systems. Stream flow in the middle section of Kanab Creek is intermittent from several miles south of the town of Alton downstream to the White Cliffs area, flowing only during snowmelt runoff or infrequent high intensity precipitation events.

Stream flow is highly seasonal in Kanab Creek and tributaries. An inverse relationship exists between stream flow and TDS concentrations in upper Kanab Creek, resulting in a strong seasonal signature in TDS concentrations. Periods of low stream flow in the summer months show elevated TDS concentrations and lower TDS concentrations during high flows.

The Tropic Shale geologic formation underlays ~~most~~ much of the upper Kanab Creek watershed. This marine shale is a major salt bearing formation that acts as parent material for saline soils and alluvium. Interactions between surface and groundwater and Tropic Shale-derived soils and alluvium cause the dissolution of soluble salts present in these materials, increasing the TDS of those waters. As a result, TDS concentrations in Kanab Creek ~~naturally~~ increase near Alton. Downstream, the TDS concentrations in the perennial segment upstream of lower Kanab Creek are markedly lower than observed in upper Kanab Creek and no changes to the statewide TDS criterion of 1,200 mg/L are proposed. ~~in a downstream direction in upper Kanab Creek.~~

Geologic and hydrologic data from Kanab Creek and its tributaries near Alton, Utah, indicate that elevated TDS concentrations in these waters are primarily a result of natural ~~and~~ conditions and secondarily, unalterable (agricultural irrigation use) conditions.

Based on this assessment, the proposed alternative TDS criteria are protective of the existing and anticipated future agricultural uses of Kanab Creek's water and therefore, consistent with the agricultural use and value of the water. These alternative criteria will continue to protect downstream uses.

The proposed alternative TDS criteria are:

> Kanab Creek and tributaries above Simpson Hollow Wash to irrigation diversion at confluence with Reservoir Canyon: April through November, daily maximum 1,400 mg/l.
>
> Kanab Creek and tributaries from immediately below the confluence with Sink Valley Wash to the confluence of Simpson Hollow Wash: April through November, daily maximum 1,900 mg/l. December through March, daily maximum 1,700 mg/l.

Foreword

This document supports a proposed change to Utah's Water Quality Standards but does not change the standards. Only the Utah Water Quality Board may amend the Water Quality Standards through rulemaking after considering public comments.

KANAB CREEK - USE AND VALUE ASSESSMENT AND REVISED CRITERIA FOR TOTAL DISSOLVED SOLIDS

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Purpose

This document provides required information in support of alternative water quality criteria for total dissolved solids (TDS) for a portion of Kanab Creek in Kane County, Utah. State and federal laws authorize the adoption of site-specific criteria that reflect local environmental conditions. Utah's Water Quality Standards (UAC R317-2-7.1) specifies that: "Site-specific standards may be adopted by rulemaking where biomonitoring data, bioassays, or other scientific analyses indicate that the statewide criterion is over or under protective of the designated uses or where natural or un-alterable conditions or other factors as defined in 40 CFR 131.10(g) prevent the attainment of the statewide criteria as prescribed in Subsections R317-2-7.2, and R317-2-7.3, and Section R317-2-14."

The federal water quality standards regulation at 40 CFR 131.11(b)(1)(ii) provides Utah the authority to adopt water quality criteria that are "modified to reflect site-specific conditions." The Clean Water Act and implementing regulation at 40 CFR 131.10 differentiate between §101(a)(2) uses; commonly referred to as the "fishable/swimmable" goals of the CWA, and other uses. 40 CFR 131.10(a) & (k)(3) note that use attainability analyses are not required to remove or revise non-101(a)(2) uses but States must submit documentation (this document) justifying how their consideration of the use and value appropriately supports the State's proposed change in designated use or criteria. The scope of this document is limited to meeting these requirements.

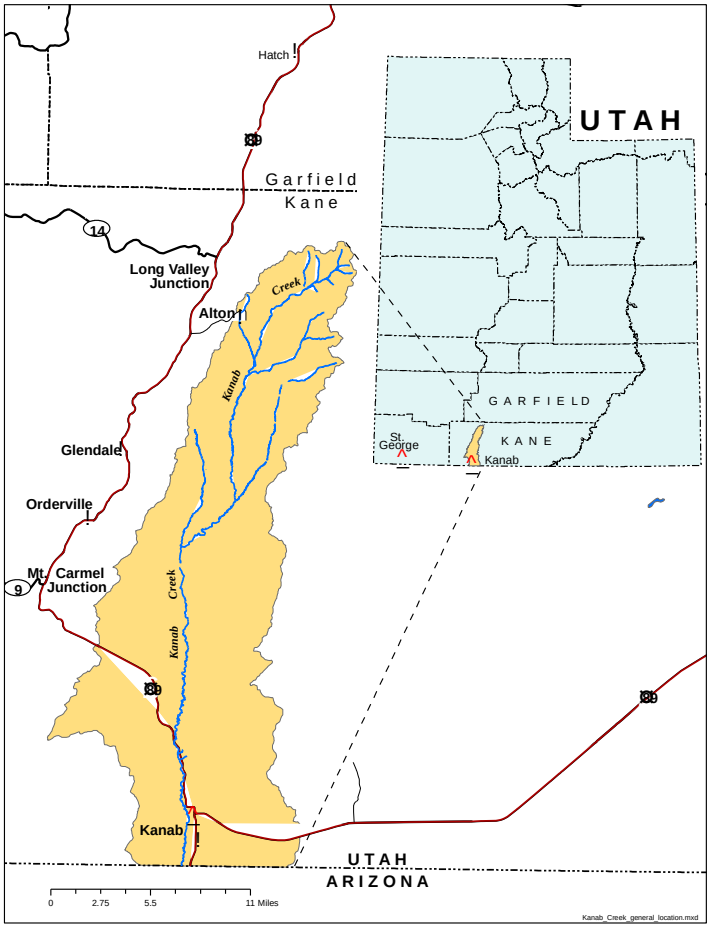
Background

A segment of Kanab Creek (Assessment Unit UT15010003-003_00 - Kanab Creek-2) was listed as impaired for its agricultural beneficial use on Utah's 2012 303(d) list. The assessment found that TDS concentrations in the creek exceeded the 1,200 mg/l TDS criterion established for the protection of the agricultural use. The initial listing was on assessment of data provided by the Utah Division of Oil, Gas and Mining (DOGM) that were collected as part of a baseline-monitoring program for the Coal Hollow Mine, located in the Kanab Creek Watershed. The data showed that TDS concentrations were elevated above the state criterion pre-mining and were therefore suspected to be due to natural conditions.

Watershed Description

Kanab Creek is a tributary of the Colorado River located in south central Utah (Figure 1). From its headwaters, Kanab Creek flows for approximately 30 miles to the south through the town of Kanab, Utah to the Utah-Arizona state line. Kanab Creek drainage encompasses approximately 626 mi^2 of Kane County, Utah. Perennial headwaters reach a maximum of 8,500 feet elevation, while Kanab Creek exits the state at an elevation of 4,800 feet.

Mean annual precipitation in the town of Alton (elevation 7,000 feet) was approximately 16.7 inches from 1915 to 2016, and mean annual maximum temperature for this same period was 60.0 degrees Fahrenheit (Western Regional Climate Center, 2016). The Colorado Plateau province receives most of its precipitation in the form of snow during the winter months; summers are generally hot and dry with a mid- to late-summer monsoon period when frequent thunderstorms occur.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89
Garfield
Kane
14
Long Valley Junction
Alton
Creek
Kanab
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Orderville
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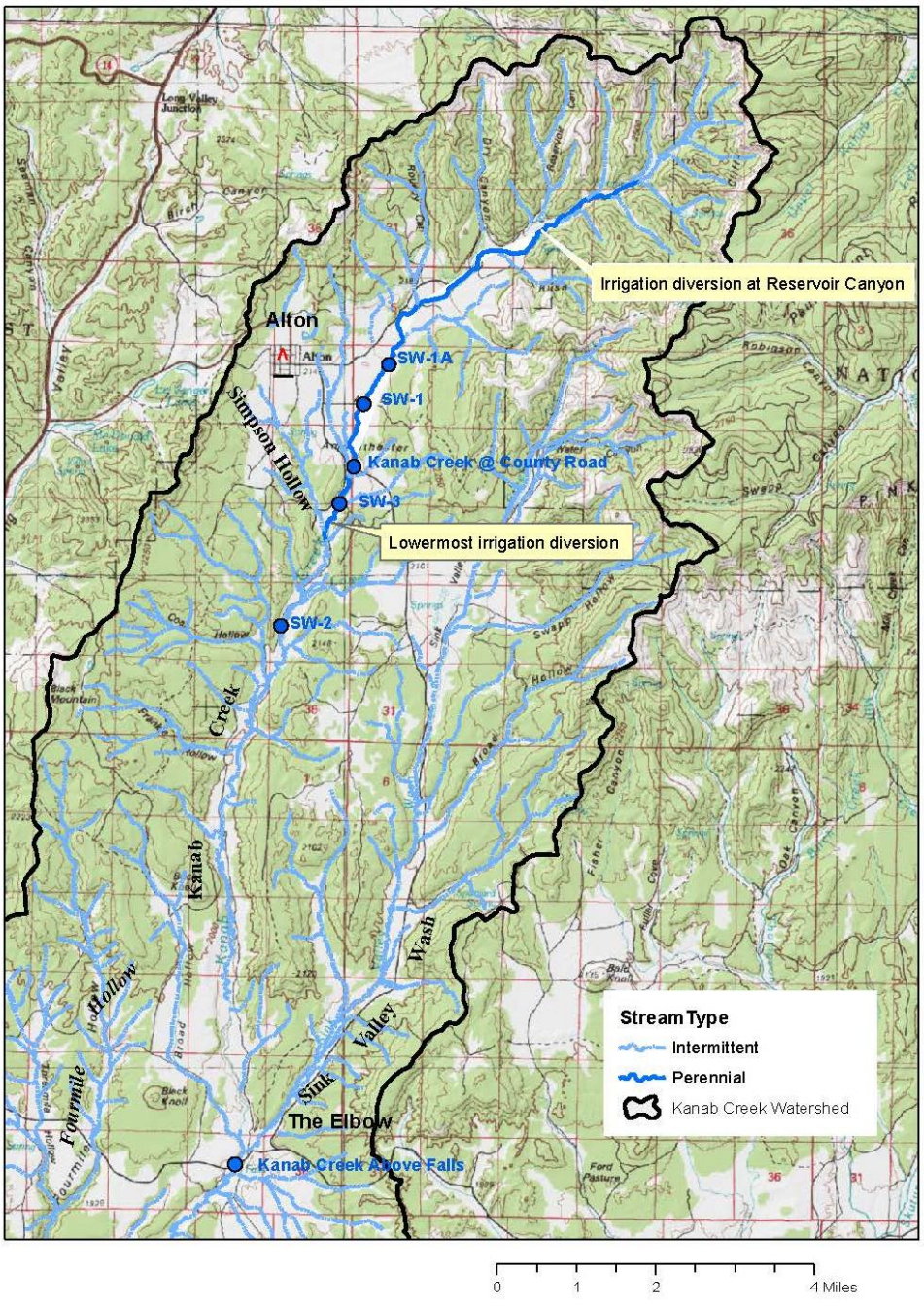

FIGURE 1. GENERAL LOCATION OF THE KANAB CREEK WATERSHED

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The majority of the watershed is located in the Colorado Plateau Semidesert Province (Wood, et. al, 2001). Vegetation is typical of the Colorado Plateau and includes large open areas of bunchgrass, perennial grasses, and sagebrush interspersed with dense stands of juniper and pinyon pine.

Hydrology

Both upper and lower Kanab Creek have segments of perennial flow supported by two different base flow systems (Goode, 1964). Kanab Creek's headwaters, located approximately five miles northeast of the town of Alton, are made up of a series of springs emanating below the rim of the Paunsaugunt Plateau, at the base of the Pink Cliffs (Claron Formation) (Figure 2). Surface flows from the plateau do not contribute to Kanab Creek, as these drainages flow in the opposite direction to the northeast. Stream flow in the middle section of Kanab Creek is intermittent from several miles south of the town of Alton downstream to the White Cliffs area, flowing only during snowmelt runoff or infrequent high intensity precipitation events. In the lower watershed, Kanab Creek again becomes perennial as it cuts into the Navajo Sandstone and intercepts

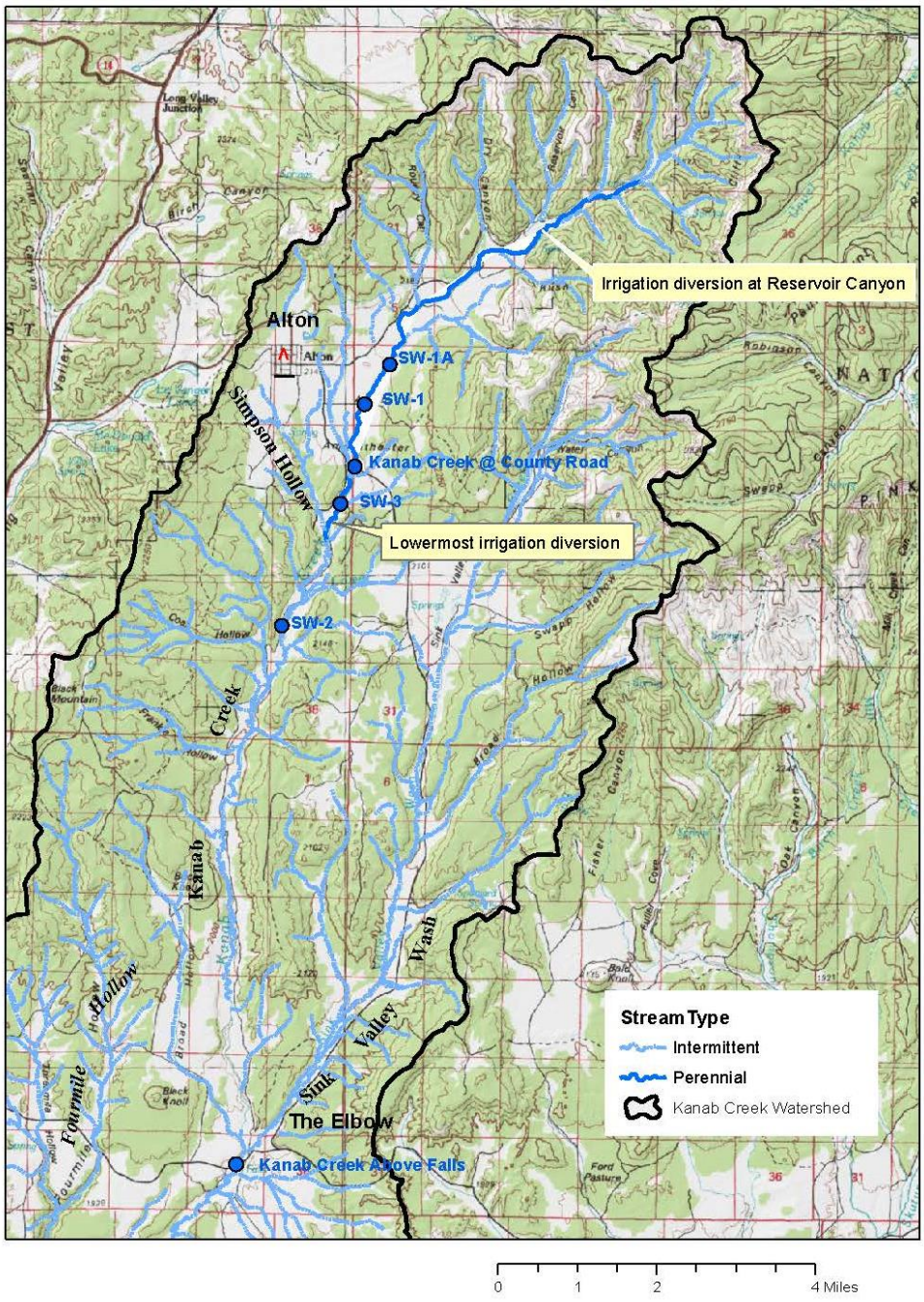

FIGURE 2. UPPER KANAB CREEK WATERSHED SHOWING KEY FEATURES AND SAMPLE LOCATIONS.

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groundwater from the significant aquifer contained by that formation. The Navajo Sandstone is the principal deep aquifer in this region and provides high-quality groundwater to agricultural, municipal, and domestic wells in the area (Goode, 1964).

Most of Kanab Creek's annual runoff occurs during late winter and early spring due to snowmelt and precipitation. High peak flows can also occur during summer monsoonal storms driven by short duration, high intensity precipitation events. Stream flows generally peak during March, but may vary from year to year depending on local weather conditions and yearly snowpack (BLM, 2018). Stream flow in the summer and fall is much lower than spring conditions, except when infrequent storm-produced flows occur. Figure 3 illustrates this pattern of flow at the *Kanab Creek at County Road* site near Alton.

During the irrigation season of April through November, the majority of Kanab Creek's headwater sources are diverted for agricultural use upstream of the town of Alton. Irrigation diversions take virtually all of the Kanab Creek flow at this point. Diverted water is piped into a series of constructed ponds that ring the upper reaches of the watershed where it is held until called for irrigation use. Water is only released into Kanab Creek during high flow events or when all storage reservoirs are full. During low water years, upper Kanab Creek is diverted all year (Heaton, 2018).

A small amount of flow from irrigation recharge and/or localized shallow alluvial aquifer reenters the creek through this reach and the section of Kanab Creek in proximity to Alton is usually perennial (Figure 4) (Goode, 1964), with median flows during the irrigation season of 0.45 cfs. An additional agricultural diversion a few miles south of Alton on Kanab Creek, just above the confluence with Simpson Hollow, takes any available water so summer flows in Kanab Creek become very low (median flow 0.08 cfs) at this point. Kanab Creek is a losing stream in this reach and for much of the year the minimal flow left in the creek typically does not reach the "Elbow" (Peterson Hydrologic 2014), the name referring to the area of the confluence with (ephemeral) Sink Valley Wash (Figure 2).

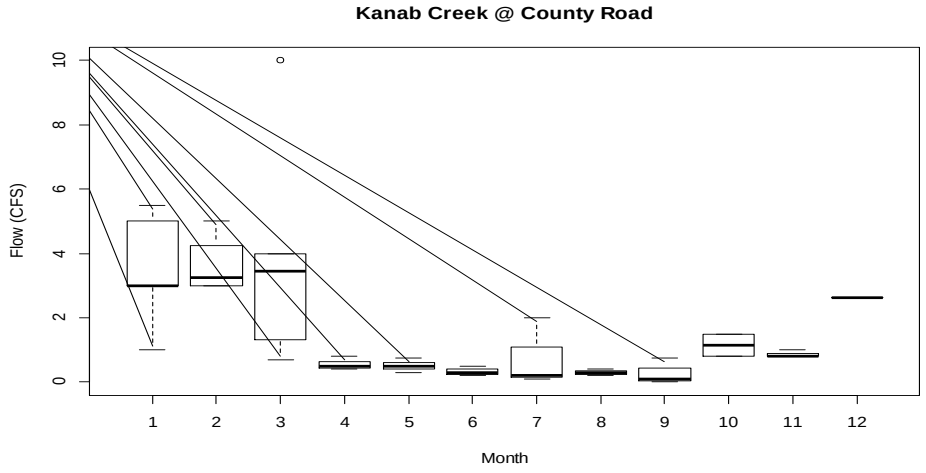

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FIGURE 3. BOX PLOTS OF MONTHLY STREAM FLOW, *KANAB CREEK AT COUNTY ROAD*

FIGURE 4. KANAB CREEK ABOVE ALTON, ADJACENT TO IRRIGATED CROPLAND (PHOTO: A. DICKEY, JUNE 6, 2018)

Geology

Kanab Creek cuts through alternating bedrock and alluvial reaches as it flows down the full length of the Grand Staircase; a series of cliffs and benches formed in Mesozoic sandstones, mudstones and shales. Figure 5 shows a diagrammatic cross section of the Grand Staircase in western Kane County from north to south. The diverse geology traversed by Kanab Creek between its headwaters and the state line has a marked influence on both the water quality and quantity of the drainage. Figure 6 shows a simplified geologic map of the Kanab Creek Watershed.

Kanab Creek's upper watershed lies on sedimentary rock derived from marine sediments deposited during incursion and regression of the Western Interior Seaway from the east during the late Cretaceous (Tilton, 2001). From oldest to youngest, the formations are the Dakota, Tropic Shale, Straight Cliffs, Wahweap, Kaiparowits and Claron. The broad-floored valley of the Alton Amphitheater erodes into the relatively less resistant mudstones of the Tropic Shale Formation. As a result, ~~the entire headwaters~~much of the upper watershed is ~~are~~ underlain by the Tropic Shale or by alluvium ~~derived largely~~ from that formation and other upgradient formations (Gregory, 1951).

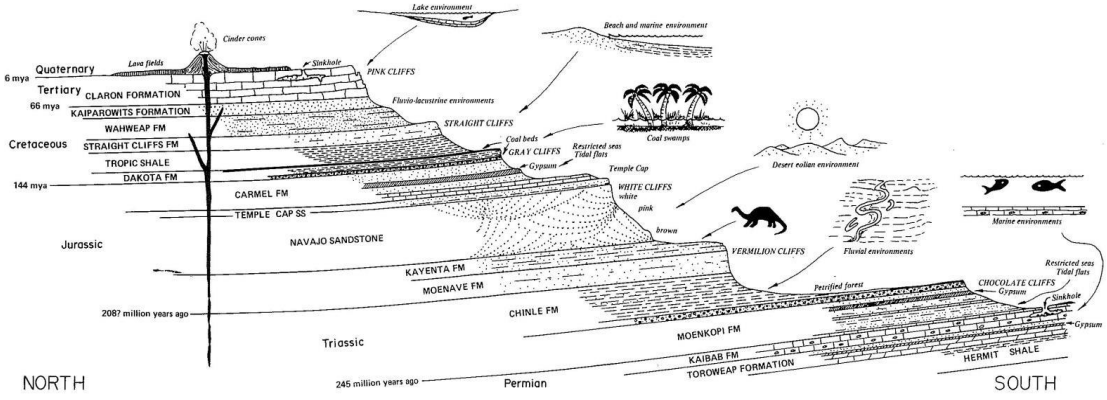

FIGURE 5. DIAGRAMMATIC CROSS SECTION OF THE GRAND STAIRCASE IN WESTERN KANE COUNTY (DOELLING, ET.AL., 1984)

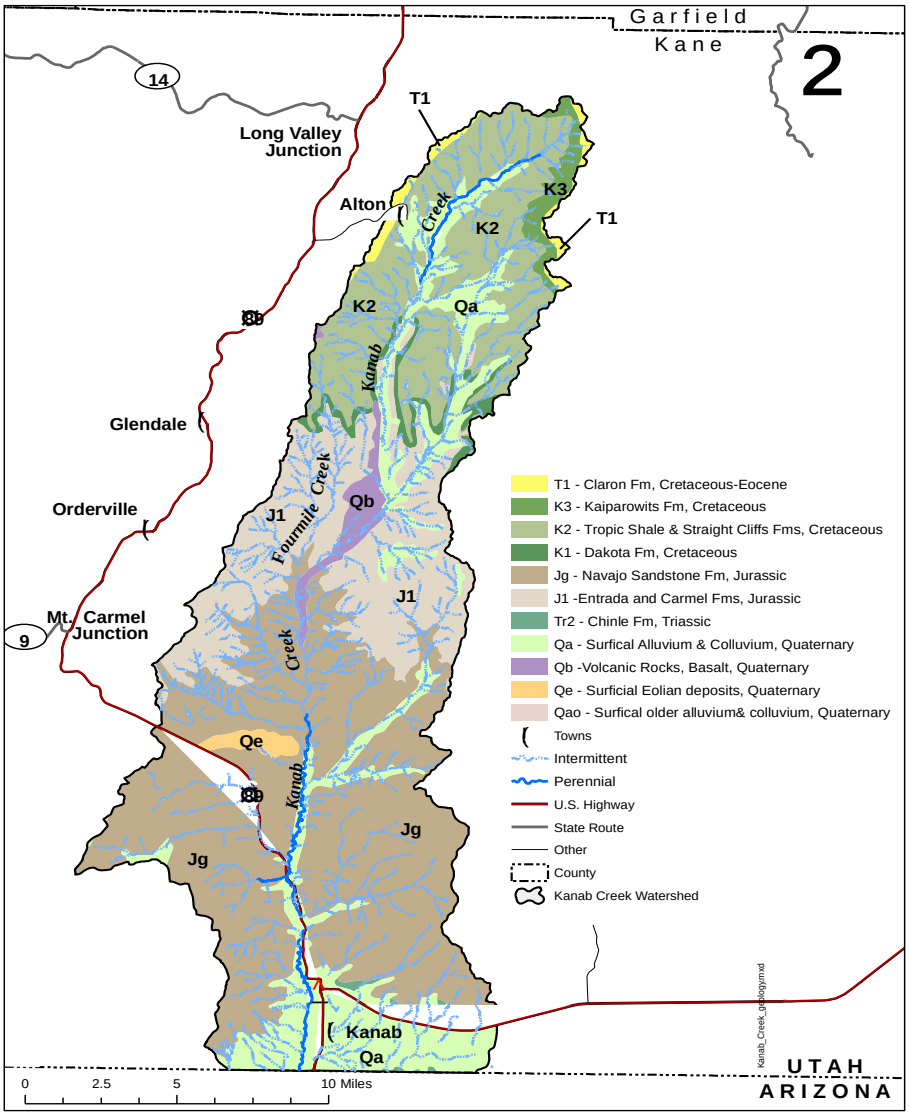

FIGURE 6.SIMIPLIFIED GEOLOGIC MAP OF THE KANAB CREEK WATERSHED.

TROPIC SHALE

The siltstones and mudstones of the Tropic Shale were deposited in an offshore marine environment during the late Cretaceous. Several investigators have noted that the Tropic Shale is the equivalent of the lower segments of the Mancos Shale found in Arizona, Colorado, and New Mexico and the Tununk Member of the Mancos Shale in eastern Utah. (Tibert and Leckie, 2013; Robison, 1966).

FIGURE 7. EXAMPLE OF STEEP-SIDED ARROYO IN TROPIC SHALE, EPHEMERAL TRIBUTARY TO KANAB CREEK. (PHOTO A. DICKEY)

The impacts of salts and other contaminants from marine shale formations to surface waters in semiarid western lands are well-known (US Department of Energy, 2011; Evangelou et al. 1984; Schumm and Gregory, 1984). In the Kanab Creek Watershed, the Tropic Shale and, to a lesser extent, the Carmel Group are identified as major salt bearing formations that act as parent material for saline soils (BLM, 2008).

Drainages flowing on the soft sediments of the Tropic Shale cut deep, unstable steep sided arroyos in many reaches of Kanab Creek and its tributaries (Figure 7). Petersen (2014) observed that many of the principal drainages and tributaries in the upper Kanab Creek watershed are not in stable configurations and are actively eroding their channels through down-cutting and entrenchment during precipitation and snowmelt flow events. It is likely that the increased sediment load contributed by these erosional processes provides increased potential for interactions between the surface water and soluble minerals in the shale-derived sediments, increasing TDS concentrations (Laronne and Shen, 1982).

Based on results of a drilling program in the lower portion of the Tropic Shale, Petersen (2007) noted the poor water-bearing and water-transmitting properties of the formation, finding that the Tropic Shale acts as a barrier impeding downward migration of groundwater and forms a basal confining layer for shallow alluvial groundwater systems where it is present.

Agricultural Land Use and Irrigation

The primary uses of surface water in Kanab Creek are irrigation and stock watering. As shown in Figure 8, virtually all irrigated crops in the upper watershed are grown in direct proximity to Alton. In years when water is available, some additional pasturelands near the confluence of Kanab Creek and Simpson Hollow are flood irrigated. The remainder of the acreage in the watershed is utilized as rangeland.

Based on the most recent water related land use information (UDWR, 2018; Figure 8; Table 1) irrigation in the area is predominantly conducted with wheel line and center pivot sprinklers (61%), and to a lesser extent, flood irrigation (31%). The majority of crops grown in the area are intended for livestock feed and forage. Primary crops are alfalfa (49.2%) and grass pasture (25.1%) (Table 2). Heaton (2018) indicated that triticale and barley are sometimes rotated with irrigated alfalfa crops. Only a small percentage (less than about 1000 acres) of the 626 mi^2 watershed is used for irrigated agricultural, so the anthropogenic influence from irrigated agriculture is very limited.

As is the case for much of the region, a limiting factor for agricultural activities in the Alton area is a reliable supply of water. Crop yields and rangeland forage for livestock commonly show considerable variability from year to year depending on the prevailing climatic conditions and surface-water availability (Petersen, 2011).

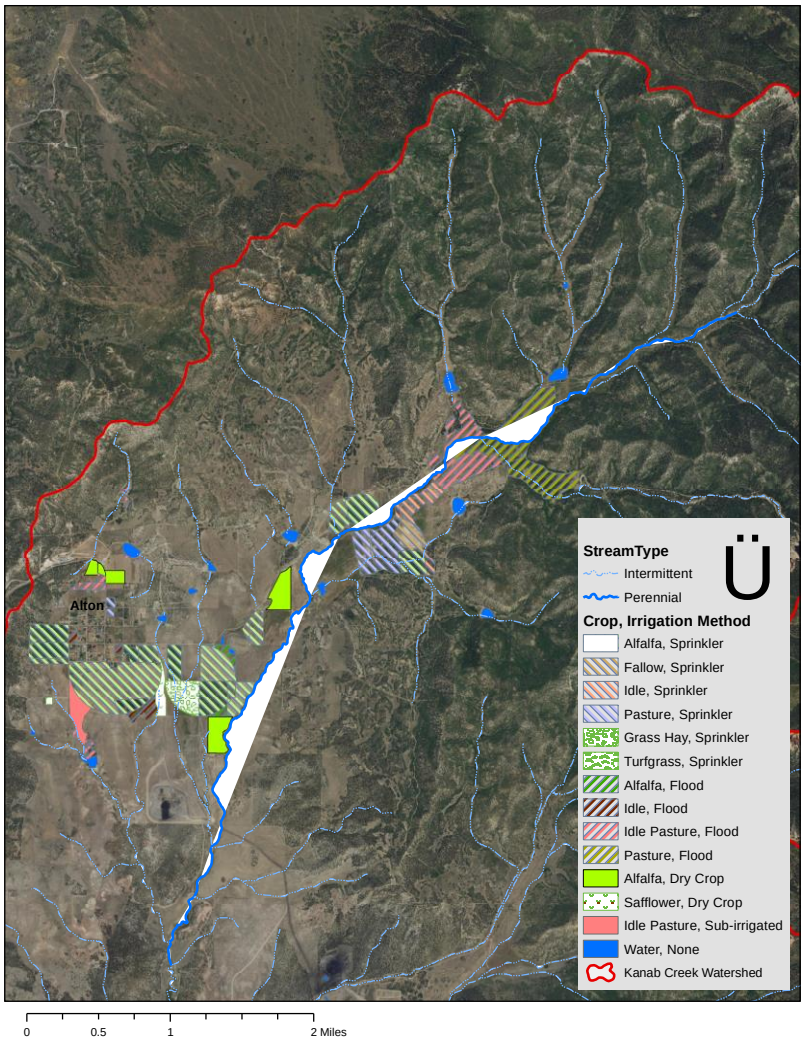

FIGURE 8. CROP TYPE AND IRRIGATION METHOD, UPPER KANAB CREEK WATERSHED. DATA IS FROM WATER RELATED LAND USE INFORMATION COMPILED BY THE UTAH DIVISION OF WATER RESOURCES - SURVEY YEAR 2017 (UDNR, 2018).

The majority of Kanab Creek's perennial headwater sources, as well as seasonal flow from intermittent and ephemeral channels, are diverted upstream of Alton and routed to a series of constructed ponds ringing the agricultural lands where it is held until called for irrigation use. The perennial headwaters of Kanab Creek have been diverted and utilized for agricultural irrigation since the area was first settled. In discussing the history of European settlement of Upper Kanab Creek and Alton, Gregory (1954) wrote:

> *To provide "better homes for our children" and "space for schoolhouse and church," the residents of Upper Kanab in 1908 selected the present Alton as a site "Where a compact village could be built and ranch lands converted into farm lands by the construction of a high-level ditch".*

Gregory noted in 1954 that a three-mile long canal carried about 7 cfs of water from upper Kanab Creek to conveniently placed reservoirs around Alton, as well as a smaller ditch carrying water from an upper tributary. Kanab Creek's headwater source springs produce high quality water from the base of the Pink Cliffs (Claron formation). Goode (1964) found TDS concentrations in the primary upper Kanab Creek spring and Kanab Creek tributary Rush Hollow of 277 mg/l and 472 mg/l respectively.

Recent projects in upper Kanab Creek include several new irrigation reservoirs and conversion of flood irrigation to sprinkler or pivot irrigation systems. Thousands of acres of rangeland have undergone vegetation treatments to improve forage production for livestock and wildlife. As part of these projects, flows in the creek may have increased by the removal of approximately 20 acres of Russian Olive trees from riparian areas (USU, 2020).

TABLE 1. IRRIGATION TYPES. ALTON, UTAH AREA (UDWR, 2018).

Irrigation Method	Acres	Percent
Sprinkler	515.1	59.0
Flood	271.6	31.1
Dry Crop	67.1	7.7
Sub-irrigated	19.6	2.2
Total	873.4	100.0

TABLE 2. WATER-RELATED AGRICULTURAL LAND USES: ALTON, UTAH AREA, ALTON, UTAH AREA (UDWR, 2018).

Crop	Acres	Percent
Alfalfa	430.4	49.3
Pasture	219.0	25.1
Idle Pasture	110.3	12.6
Idle	49.4	5.7
Grass Hay	28.8	3.3
Fallow	23.4	2.7
Safflower[1]	10.6	1.2
Turfgrass	1.5	0.2
Total	873.4	100.0

[1] Safflower is reported by UDWR but the USU Extension Service reports that safflower is unlikely a crop in the area because this crop is not in their records and requires a combine to harvest.

Designated Use Segments and Assessment Units

Kanab Creek from the Arizona state line to headwaters is currently divided into two segments in the water quality standards and three Assessment Units (AUs) for CWA Section 305(b) and 303(d) Integrated Reports. The two segments from the water quality standards, the three AUs and the corresponding designated uses are shown in Table 3.

As shown in Table 3, the designated uses of Kanab Creek and tributaries, from the Arizona state line to irrigation diversion at confluence with Reservoir Canyon are Classes 2B, 3C, 4. This segment includes the AUs, Kanab Creek-1 and -2. This report ultimately focuses on Kanab Creek from the *above Falls* monitoring location (bottom of Figure 9), upstream to the boundary where the aquatic life use changes from Class 3C to 3A (near top of Figure 9). This is also the boundary between AUs Kanab Creek-2 and -3. The other key features illustrated on Figure 9 are discussed later in the report.

Descriptions of the designated use classes from UAC R317-2-6 are as follows:

> *2B Protected for infrequent primary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water, such as boating, wading, or similar uses.*
>
> *3A Protected for coldwater species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.*
>
> *3C Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.*
>
> *4 Protected for agricultural uses including irrigation of crops and stock watering.*

TABLE 3. SUMMARY OF KANAB CREEK DESIGNATED USE SEGMENTS AND ASSESSMENT UNITS (AU).

R317-2-13.2b Description	AU Name	AU Description	AU ID Number	Designated Use Classes
Kanab Creek and tributaries, from state line to irrigation diversion at confluence with Reservoir Canyon	Kanab Creek -1	Kanab Creek and tributaries from state line to the confluence with Fourmile Hollow near the White Cliffs	UT15010003-002_00	2B, 3C, 4
Kanab Creek and tributaries, from state line to irrigation diversion at confluence with Reservoir Canyon	Kanab Creek -2	Kanab Creek and tributaries from the confluence with Fourmile Hollow near the White Cliffs to Reservoir Canyon	UT15010003-003_00	2B, 3C, 4
Kanab Creek and tributaries, from irrigation diversion at confluence with Reservoir Canyon to headwaters	Kanab Creek -3	Kanab Creek and tributaries from Reservoir Canyon to headwaters	UT15010003-006_00	2B, 3A, 4

DATA SOURCES AND ANALYSES

Data Sources

Water quality data for this assessment were obtained from two primary sources: 1) DOGM Utah Coal Mining Water Quality Database (UDOGM, 2019), and; 2) DWQ's Ambient Water Quality Management System (AWQMS) database (UDWQ, 2019). The DOGM Coal Mining Water Quality Database contains data collected as part of an extensive baseline monitoring program developed for the Coal Hollow Mine. In addition to the perennial sites on Kanab Creek, samples were collected at various times and locations from a variety of sources such as ephemeral and intermittent tributaries, springs and seeps throughout the watershed. Data collected from this large array of sites exhibit a high degree of temporal and spatial variability. Many of these sites were sampled infrequently. As a result, DWQ has focused on data collected from sites located on the perennial reaches of Kanab Creek.

Table 4 lists the monitoring stations and time periods for relevant data. DOGM's sample sites are referenced by alpha-numeric, e.g., *SW-2*, and DWQ's referenced by station name, e.g., *Kanab Creek at County Road*. Figures 9 and 10 display the location of water quality monitoring stations referenced by this report. Appendix B includes all data considered. For this Use and Value Assessment, ambient TDS concentrations include both natural and un-alterable conditions. Un-alterable conditions would include dams and diversions but not point source discharges. As discussed in the following sections, additional processing was necessary to ensure that the data used represent ambient TDS concentrations.

TABLE 4. RELEVANT WATER QUALITY MONITORING LOCATIONS, LISTED UPASTREAM TO DOWNSTREAM, KANAB CREEK.

Site ID	Source	Description	Data Period
SW-1A	DOGM	Kanab Creek east of Alton	Quarterly 2016-2017
SW-1	DOGM	Kanab Creek Above North Lease	Quarterly 1987-1988; 2005-2009; 2015-2017
SW-1M	DOGM	Kanab Creek Mid North Lease	Quarterly 2016-2017
4951940	DWQ	*Kanab Creek at County Road*	Monthly 2013-2017
SW-3	DOGM	Kanab Creek Above Simpson Hollow Wash	1987-1988; 2005-2017
SW-2	DOGM	Kanab Creek below Robinson Wash	1987-1988; 2005-2017
4951830	DWQ	*Kanab Creek above Falls*	Monthly 2006-2017
4951810	DWQ	*Kanab Creek at US 89 Crossing*	Monthly 2006-2017

DOGM = Utah Division of Oil, Gas and Mining
DWQ = Utah Division of Water Quality

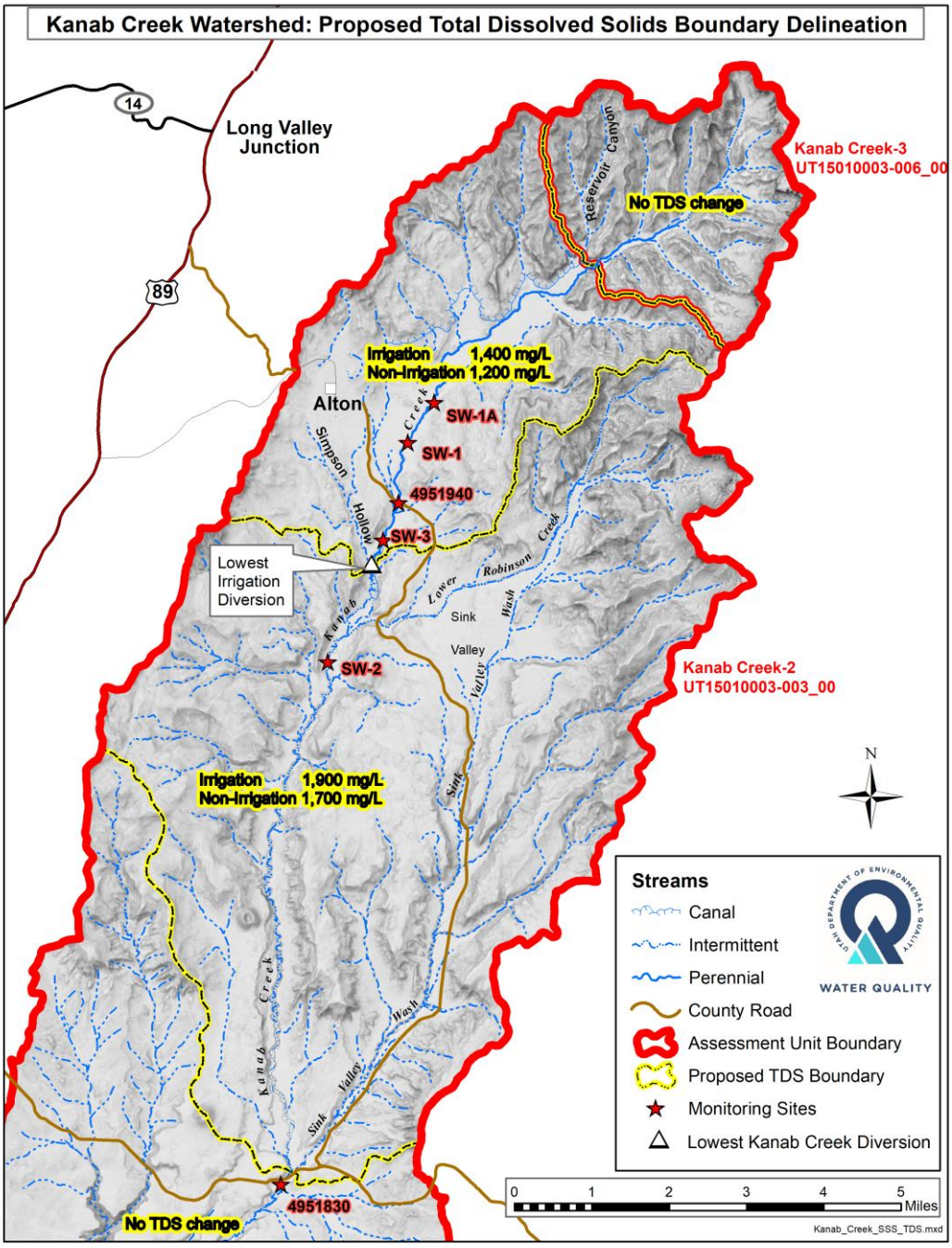

FIGURE 9. WATER QUALITY MONITORING SITES AND PROPOSED TDS CRITERIA IN THE UPPER KANAB CREEK WATERSHED

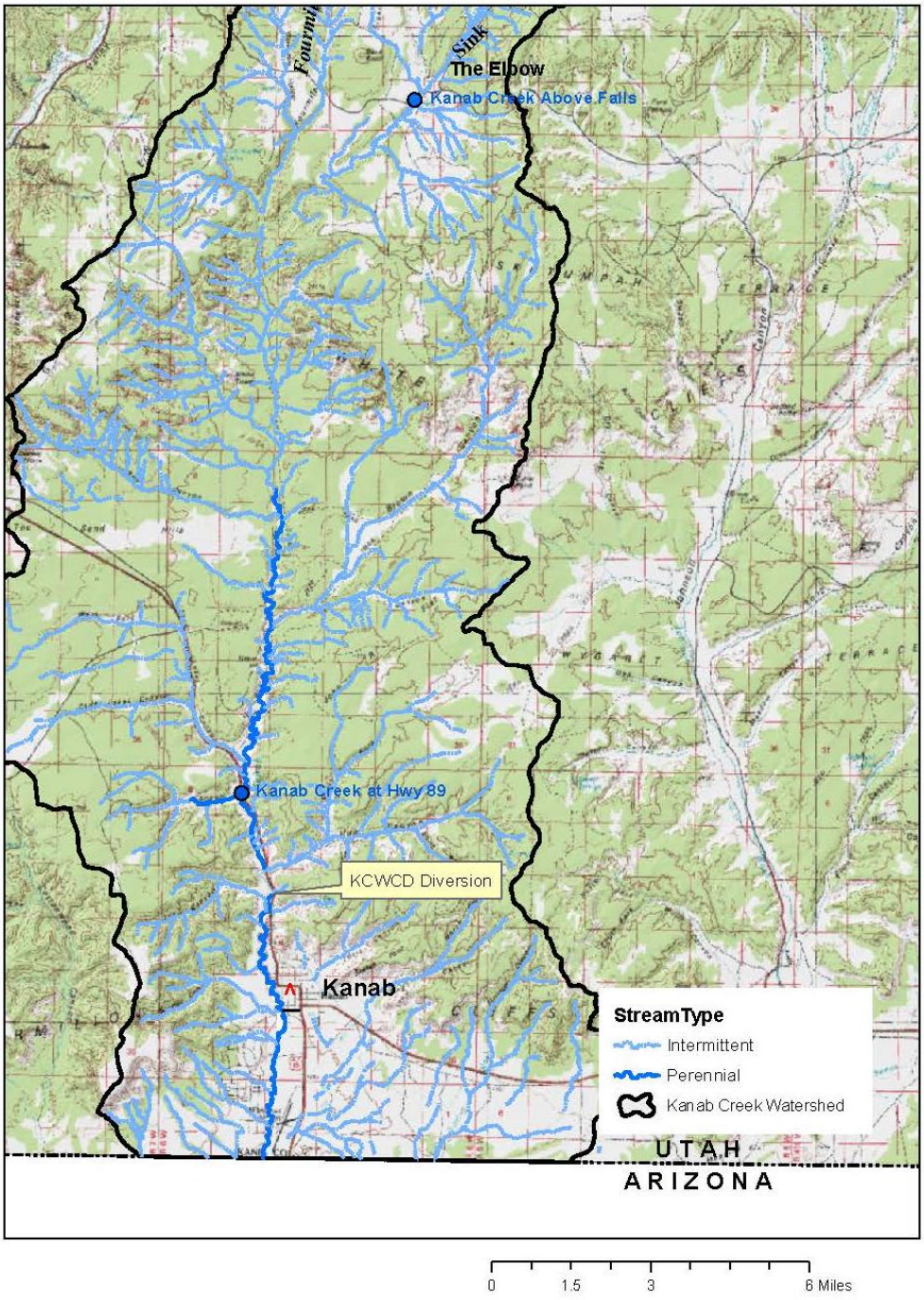

FIGURE 10. THE LOWER KANAB CREEK WATERSHED AND WATER QUALITY MONITORING SITE (*KANAB CREEK AT HIGHWAY 89 CROSSING*)

Data Use Considerations and Limitations

COAL HOLLOW MINE

Any discharges from the Coal Hollow Mine directly impact upper Kanab Creek. The Coal Hollow Mine holds a Utah Pollution Discharge Elimination System (UPDES) permit (UT0025992) allowing discharge from holding ponds on their mine site. The ponds are a mix of sedimentation ponds that capture only surface flow and those that hold both surface water and water intercepted by mining operations. The ponds were designed and sized to contain all water generated under reasonably expected climatic conditions (and use the captured water for operational uses such as dust suppression). The ponds are temporary and constructed on an as-needed basis so the location of the active outfalls may change over time. Discharges from the Coal Hollow Mine are infrequent and the flow volumes and TDS concentrations modest (Table 5).

The receiving water for the majority of the mine discharges is Robinson Wash, which meets Kanab Creek above monitoring site *SW-2*. However, in the fall of 2015, an additional sedimentation pond discharging to an unnamed ephemeral tributary of Kanab Creek was constructed. This tributary meets Kanab Creek between monitoring sites Kanab Creek at County Road and *SW-3*. In the fall of 2017, another sedimentation pond was constructed which discharges to Kanab Creek just above the *at County Road* site. Detailed maps of the mining tracts are available in BLM (2018).

TABLE 5. SUMMARY OF DISCHARGES FROM THE COAL HOLLOW MINE

Year	TDS Range (mg/L)	Flow (gpm)	Notes
2010			Discharge in December after a 10-year, 24-hour precipitation event was followed immediately by 100-yr, 24-hour precipitation event.
2011	704-1,820	1.3-15	Six events
2012			No discharges
2013			No discharges
2014	380-1,020	14.2-25	September only
2015	292-1,170	0.001-132	Intermittent discharges during March, September, October, November, and December
2016	244-984	0.03-50	Intermittent discharges during February, March, May, September, and October

TDS = Total Dissolved Solids

Data were removed when a pond discharges had the potential to influence ambient water quality at those sites. The data for the following sites and time periods were removed:

- *Kanab Creek at County Road*, all 2017 data
- *SW-3*, all data from 10/15/2015 – 2017

- *SW-2*, all data from 2015-2017

FIGURE 11~~12~~. ***KANAB CREEK ABOVE FALLS*, LOOKING DOWNSTREAM TO PONDED WATER** (PHOTO A. DICKEY)

FIGURE 12~~11~~. ***KANAB CREEK ABOVE FALLS*, LOOKING UPSTREAM** (PHOTO A. DICKEY)

KANAB CREEK ABOVE FALLS MONITORING SITE,

One of DWQ's monitoring sites for Kanab Creek is located at the county road crossing immediately upstream of "*the falls*", a feature where the channel of Kanab Creek drops approximately 25 feet over a resistant igneous dike of fine grained basalt that is present in the area (Tilton, 2001). Figure 11 shows a photograph of the bed of Kanab Creek looking downstream at the falls and the pool of water and wetland area that is commonly present at the base of this bedrock ledge. The pool of water at the base of the ledge persists through the summer months when there is no upstream flow in Kanab Creek, and is likely sustained by ground water seepage from the bedrock outcrop (Petersen, 2014). Figure 12 shows the dry bed of Kanab Creek looking immediately upstream of the falls.

Initially, this site appeared to have strong data record because samples were collected since 1995 and then monthly from 2006-2017. However, the availability of regular monthly samples was puzzling because Kanab Creek generally does not flow at this location for several months of the year. DWQ subsequently determined that water quality data obtained from this site are a combination of: 1) infrequent samples representing flow from upstream collected during snowmelt or high intensity precipitation events; and, 2) more commonly, samples taken from the ponded water at the base of the falls when no flow was present from upstream (Esplin, 2018). Additionally, flow values (seepage) were estimated when the water was ponding. The data from *Kanab Creek above Falls* are reported but are not useful for characterizing ambient TDS concentrations because of the unresolvable uncertainties regarding sample collection. This ponded water and wetlands area are confined to the vicinity of *the falls*, and Kanab Creek remains an intermittent stream below this point.

SPECIFIC CONDUCTANCE/TDS REGRESSION

DWQ used paired data to correlate specific conductance (SC) and TDS concentrations. A linear regression was used to estimate TDS concentrations when only SC measurements were available. This increased the number of DOGM samples available for characterizing TDS concentrations. Table 6 shows the number of TDS concentrations estimated from SC measurements from the linear regression shown in Figure 13. The correlation between TDS and SC at the *above Falls* site exhibit much more scatter (r^2=0.21, data not shown) compared to the upstream sites that further illustrates the uncertainties with data collected from this site.

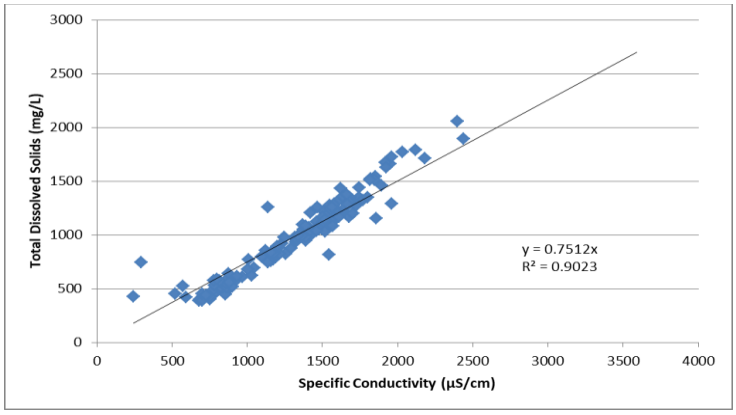

FIGURE 13. KANAB CREEK SPECIFIC CONDUCTIVITY/TDS REGRESSION RELATIONSHIP FROM *SW-1M*, *KANAB CREEK AT COUNTY ROAD*, *SW-3*, AND *SW-2*.

TABLE 6.THE NUMBER OF TDS CONCENTRATIONS ESTIMATED BY SPECFIC CONDUCTIVITY.

Site ID	Station Description	TDS Measured	Conductivity Only	Total Measurements
SW-1A	Kanab Creek east of Alton	0	8	8
SW-1	Kanab Creek Above North Lease	23	12	35
SW-1M	Kanab Creek Mid North Lease	8	0	8
SW-3	Kanab Creek Above Simpson Hollow Wash	49	8	57
SW-2	Kanab Creek below Robinson Wash	39	8	47

Data Analyses

Statistics by Monitoring Location - Upstream to Downstream

Table 7 presents summary statistics for TDS data at each monitoring location. Note that maximum and median TDS concentrations are relatively constant moving downstream to Robinson Wash where TDS

concentrations increase to *above Falls*. TDS concentrations then are markedly lower at the next site below *above Falls* (over 15 miles downstream), *Kanab Creek at US 89 Crossing*.

TABLE 7. SUMMARY STATISTICS FOR MONITORING LOCATIONS, KANAB CREEK.

Site ID	Station Description	Count	Min. (mg/l)	Max. (mg/l)	Median (mg/l)	Mean (mg/l)
SW-1A	Kanab Creek east of Alton	8	551	1201	959	911
SW-1	Kanab Creek Above North Lease	35	404	1474	1044	956
SW-1M	Kanab Creek Mid North Lease	8	420	1220	920	851
4951940	*Kanab Creek at County Road*	42	386	1440	850	828
SW-3	Kanab Creek Above Simpson Hollow Wash	57	388	1372	836	867
SW-2	Kanab Creek below Robinson Wash	47	508	2697	1260	1275
4951830	*Kanab Creek above Falls*	109	372	2536	1130	1441
4951810	*Kanab Creek at US 89 Crossing*	105	256	618	314	332

Flow/TDS Relationship and Seasonality

A strong inverse correlation is observed when flow rates are plotted against TDS concentrations. As shown by Figure 14, the highest TDS concentrations occur during periods of low flow. High flow rates tend to produce lower TDS concentrations. This relationship is likely due to the relative proportion of groundwater.

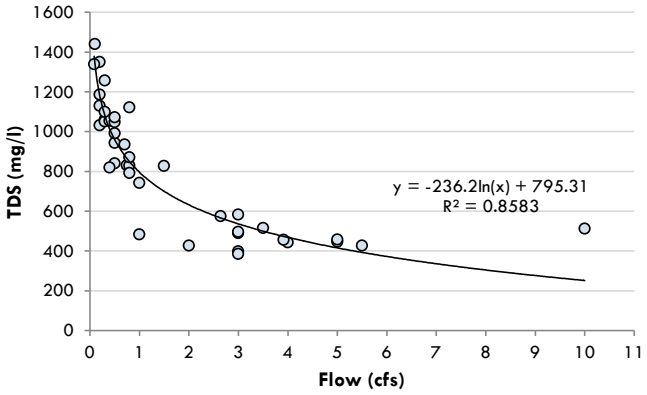

FIGURE 14. RELATIONSHIP BETWEEN FLOW AND TDS CONCENTRATION, *KANAB CREEK AT COUNTY ROAD.*

During dry conditions, the creek's baseflow is mainly sustained by flow from a shallow alluvial aquifer supplemented with recharge from irrigation activities near Alton. These groundwater sources have extended contact time with the saline soils and alluvium derived from the Tropic Shale. High quality headwater sources are also diverted from the surface waters during this time, further reducing both flow and dilution.

Conversely, during winter precipitation and snowmelt events, surface flow dominates the system and effectively dilutes the more saline baseflow component.

Unlike the upstream sites, the relationship between flow and TDS concentrations at the *above Falls* site is much less consistent (Figure 15). A similar lack of correlation was observed for TDS and SC.

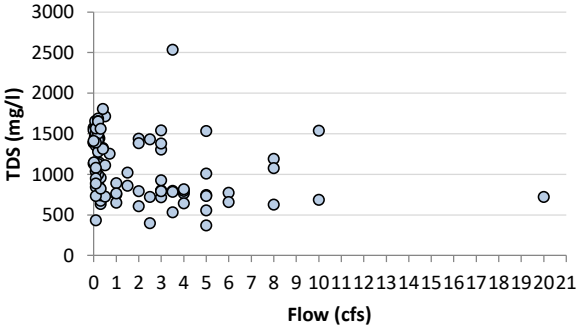

FIGURE 15. FLOW VS TOTAL DISSOLVED SOLIDS (TDS) AT *ABOVE FALLS*

As discussed and illustrated in the monthly flows shown on Figure 3, flow rates in Kanab Creek are highly seasonal, exhibiting higher flows in the winter and early spring months with summers having much lower flows. This pattern is primarily due to seasonal precipitation dynamics but stream flows are also heavily influenced by irrigation diversions. Figure 16 shows boxplots of stream flow at the primary monitoring stations on Kanab Creek divided by season: Irrigation (April-November) and Non-Irrigation (December-March). Flows in the non-irrigation season are generally much more variable than those in the irrigation season. However, infrequent high flow events, likely driven by high intensity monsoonal storms, present as outliers in the box plots of irrigation season flows.

The inverse relationship between flow and TDS, coupled with the seasonal nature of precipitation (and flow) in the watershed leads to a strong pattern of seasonality in TDS concentrations from Kanab Creek. Figure 17 shows boxplots of TDS concentrations by month from monitoring station *Kanab Creek at County Road* illustrating that TDS concentrations in the non-irrigation season months are markedly lower than concentrations found in the irrigation season months.

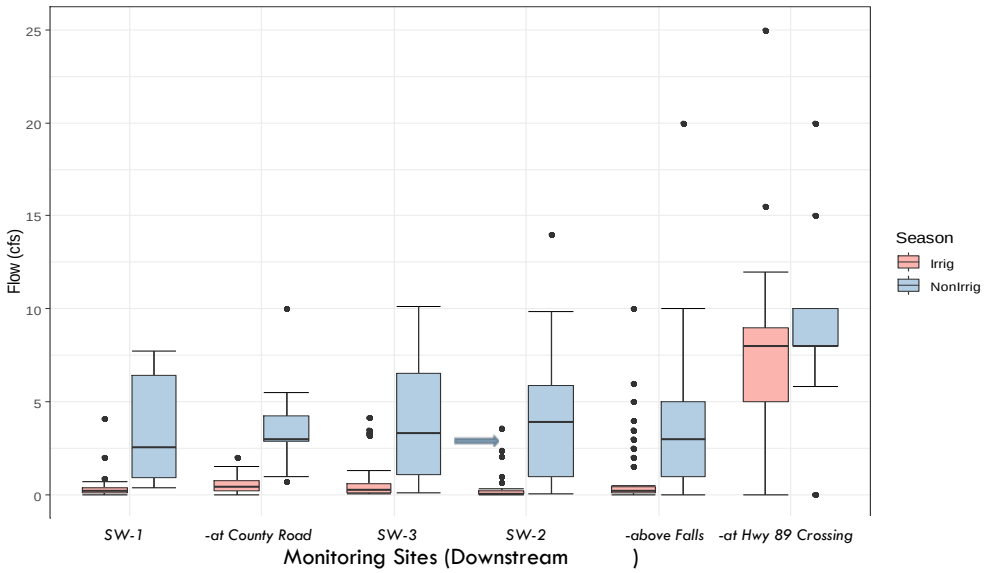

FIGURE 16. FLOW MEASUREMENTS DIVIDED BY IRRIGATION (APRIL-NOVEMBER) AND NONIRRIGATION (DECEMBER-MARCH) SEASONS

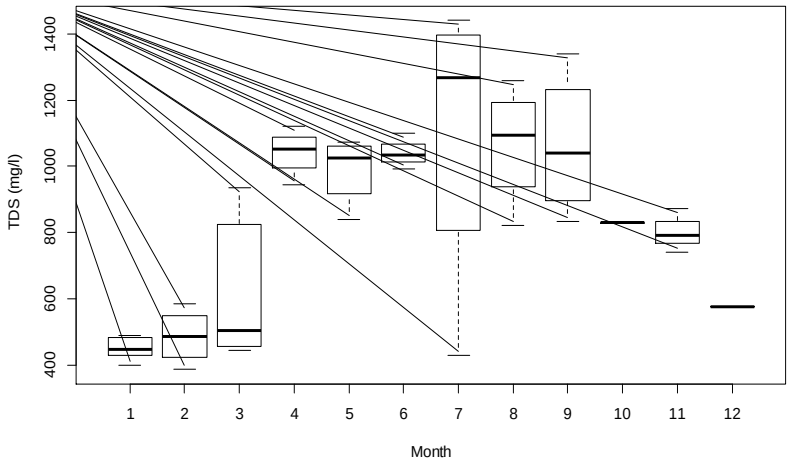

FIGURE 17. TOTAL DISSOLVED SOLIDS (TDS) CONCENTRATIONS BY MONTH AT *KANAB CREEK AT COUNTY ROAD* ILLUSTRATING SEASONAL DIFFERENCES

Using the strong pattern of seasonality from TDS values, the data were divided into irrigation and non-irrigation seasons. Figure 18 depicts the same relationship between flow and TDS presented in Figure 14 but with the data points identified by season.

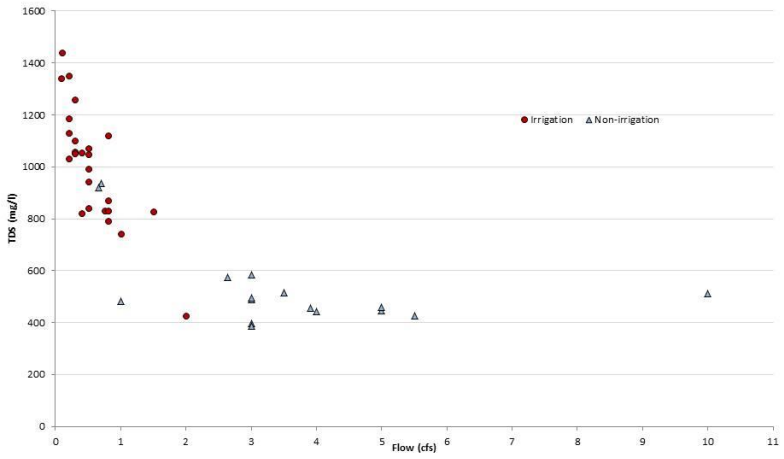

FIGURE 18. FLOW VS TOTAL DISSOLVED SOLIDS (TDS) AND FLOW BY IRRIGATION (APRIL-NOVEMBER) AND NON-IRRIGATION (DECEMBER-MARCH) SEASONS AT *KANAB CREEK AT COUNTY ROAD*

RESULTS AND RECOMMENDATIONS

Figure 19 shows boxplots of TDS concentrations at selected monitoring locations in Kanab Creek subdivided by irrigation season, from upstream to downstream. The current statewide agricultural TDS criterion of 1,200 mg/l is included for reference. Monitoring locations such as *SW-1A* and *SW-1M* are not displayed as they had very limited data for each season. TDS concentrations show significant differences between seasons at sites *SW-1, Kanab Creek at County Road, SW-3,* and *SW-2*. Conversely, the lack of strong seasonal signature in TDS values at the *above Falls* site supports the hypothesis that much of the data collected at that site represents ponded water and not upstream Kanab Creek flows.

TDS concentrations measured at the *at US 89 Crossing*, over 15 miles downstream of the *above Falls* site, are significantly lower and show much less variability, both within and between seasons, than those exhibited by data from the upper watershed (Figure 19). These findings further support that lower Kanab Creek has a different baseflow source system than the upper watershed and that the two systems are only connected hydrologically on an infrequent basis.

TDS concentration data from sites *SW-1, Kanab Creek at County Road,* and *SW-3* show similar distributions through this reach of Kanab Creek within the Alton Amphitheater, with exceedances of the 1200 mg/l TDS criteria occurring only during the irrigation season (Figure 19). Non-irrigation season concentrations are notably lower upstream of site *SW-*2, forming an apparent upstream/downstream separation in the data displayed in this figure. Concentrations increase considerably for both seasons at site *SW-2* located less than two miles downstream from *SW-3*. The data from *SW-2* show a 25% exceedance rate of the TDS criteria during the non-irrigation season, with greater than 75% of the data exceeding the 1200 mg/l criteria during the irrigation season. Reflective of the increase in TDS concentrations, the last agricultural irrigation diversion is located between *SW-2* and *SW-3.*

As Kanab Creek flows through the upper watershed, TDS concentrations increase from less than 500 mg/l in headwater sources to concentrations regularly exceeding the state criteria of 1200 mg/l for agricultural uses.

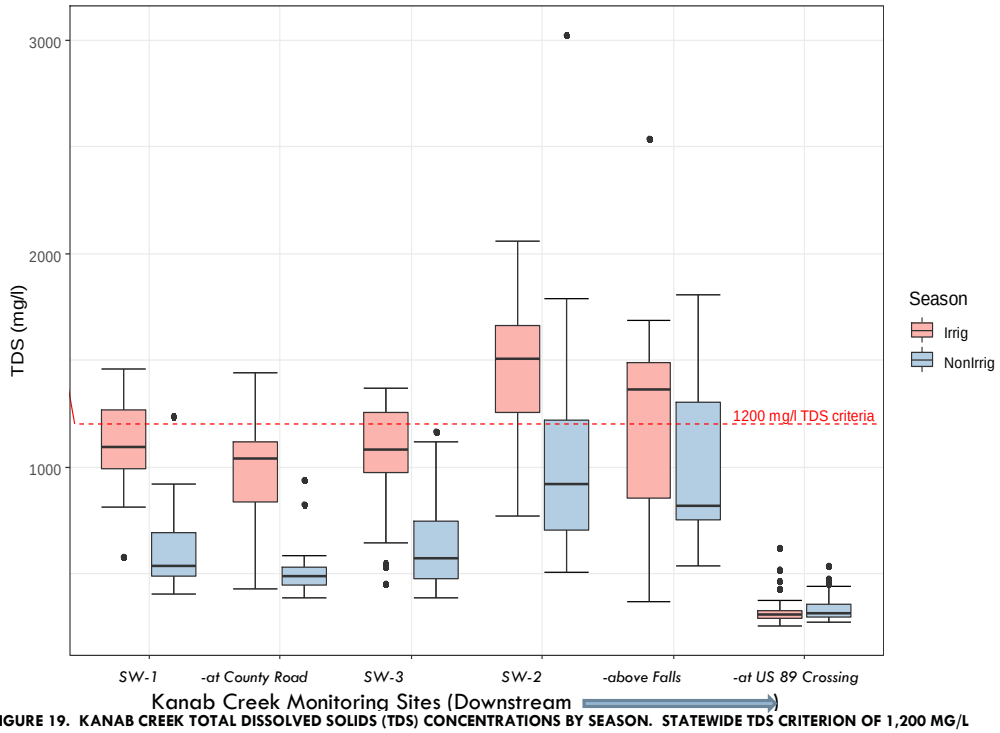

FIGURE 19. KANAB CREEK TOTAL DISSOLVED SOLIDS (TDS) CONCENTRATIONS BY SEASON. STATEWIDE TDS CRITERION OF 1,200 MG/L SHOWN

The increase in TDS concentrations is notable between monitoring sites *SW-2* and *SW-3*. This increase in TDS concentrations is likely both natural and somewhat exacerbated by agricultural irrigation use through longer contact times between the water and soils and alluvium derived from the marine Tropic Shale and Dakota formations. However, given the limited amount of water available for irrigation and the small amount of overall irrigated acreage in the area, any agricultural irrigation return flow contributions to the increased TDS concentrations are likely a relatively small percentage of the TDS loading to Kanab Creek. Both the natural and anthropogenic contributions to elevated TDS concentrations in this part of Kanab Creek are considered to be due to contact with the soils and alluvium derived from the marine Tropic Shale and Dakota formations, and are unalterable.

Revised TDS Criteria for Kanab Creek

Water quality data, along with supplemental information on geology, hydrology and land use, support the inability to meet the statewide TDS criteria for the protection of Class 4 agricultural uses and the need for ~~development of~~ alternative TDS criteria for two specific segments of upper Kanab Creek:

- (Segment 1) Kanab Creek and tributaries above Simpson Hollow Wash to irrigation diversion at confluence with Reservoir Canyon;
- (Segment 2) Kanab Creek and tributaries from the confluence with Sink Valley Wash to the confluence of Simpson Hollow Wash.

The 90th percentiles of ambient concentrations were applied to develop alternative maximum TDS criteria. The 90th percentile meets the Utah requirements because natural and unalterable (agricultural irrigation) conditions prevent the attainment of the statewide 1,200 mg/L criterion. These alternative criteria represent current conditions in upper Kanab Creek and therefore, do not represent any increase over existing TDS concentrations. The 90th percentile will continue to support the use and value of Kanab Creek for the Class 4 agricultural uses as this quality of water is currently generally supporting those uses.

Table 8 provides summary statistics, including 90th percentile values, for data from monitoring stations on Kanab Creek. Existing data were subdivided by season for the development of criteria: Irrigation (April-November) and Non-Irrigation (December-March). USEPA ProUCL was used to calculate the statistics and the output sheets are included in Appendix A.

TABLE 8. SUMMARY STATISTICS AND 90TH PERCENTILES OF TDS CONCENTRATIONS BY SEASON, KANAB CREEK.

Site ID	Station Description	Season	Count	Min. (mg/l)	Max. (mg/l)	Median (mg/l)	90th Percentile (mg/l)
SW-1	Kanab Creek Above North Lease	Irrigation	23	578	1474	1095	1362
		Non-Irrig.	12	404	1238	~~535~~565	957
4951940	*Kanab Ck. at County Road*	Irrigation	26	428	1440	1050	1292
		Non-Irrig.	16	386	936	487	704
SW-3	Kanab Creek Above Simpson Hollow Wash	Irrigation	32	452	1372	1085	1375
		Non-Irrig.	25	388	~~1120~~1167	590	917
SW-2	Kanab Creek below Robinson Wash	Irrigation	26	772	2058	1462	1857
		Non-Irrig.	21	508	~~892~~2697	~~2697~~954	1704
4951830	*Kanab Creek above Falls*	Irrigation	76	372	2536	1365	~~1701~~1576
		Non-Irrig.	33	534	1808	816	~~1716~~1539

Segment 1

KANAB CREEK AND TRIBUTARIES ABOVE SIMPSON HOLLOW WASH TO IRRIGATION DIVERSION AT CONFLUENCE WITH RESERVOIR CANYON

Data from stations *SW-1, Kanab Creek at County Road, and SW-3* have similar 90th percentile TDS Concentrations during the irrigation season (Table 8). DWQ proposes an alternative TDS maximum criterion of 1,400 mg/l (rounded to two significant figures) during the irrigation season. Non-irrigation season data from these same three monitoring stations also have similar 90th percentile TDS concentrations that meet the 1200 mg/l criterion. Therefore, no alternative criterion is proposed for the non-irrigation season. Assessments should be based on the TDS concentrations in Kanab Creek to be consistent with how the standards were derived.

The lower boundary of this segment is just downstream of SW-3 and the lowermost irrigation diversion on Kanab Creek, and immediately upstream of ephemeral tributary Simpson Hollow (Figure 9). The next irrigation diversion is at least 27 miles downstream (BLM, 2018). The upper end of the segment is the existing boundary at the confluence of Reservoir Canyon with Kanab Creek, where the aquatic life use changes from Class 3C to 3A.

Segment 2

KANAB CREEK AND TRIBUTARIES FROM IMMEDIATELY BELOW THE CONFLUENCE WITH SINK VALLEY WASH TO THE CONFLUENCE OF SIMPSON HOLLOW WASH

Data from station *SW-2* has a 90th percentile value of 1,900 mg/l during the irrigation season and 1,700 mg/l during the non-irrigation season. DWQ proposes these values as seasonal maximum TDS criteria for this segment of Kanab Creek. There are no irrigation diversions in this segment.

The downstream end of the segment is located to include the tributary of Sink Valley Wash. This ephemeral drainage is usually dry most years, contributing flow to Kanab Creek on a very infrequent basis. When the wash is flowing at its confluence with Kanab Creek, data show elevated TDS values, with 90th percentile concentrations of 2300 mg/l and 3000 mg/l in the irrigation and non-irrigation seasons respectively. Because of the ephemeral nature of this drainage, and in order to protect downstream uses in Kanab Creek, DWQ recommends that the criteria developed for the main stem of Kanab Creek also be applied to Sink Valley Wash. Assessments should be based on the TDS concentrations in Kanab Creek to be consistent with how the standards were derived.

Proposed Rule Language

The proposed changes for alternate TDS criteria for Kanab Creek will appear in the Utah Water Quality Standards at R317-2-13.2(b) Kanab Creek Drainage, and in R317-2-14. Numeric Criteria Table 2.14.1 as follows:

. (*) Site-specific criteria are associated with this use.

R317-2-13.2(b) Kanab Creek Drainage

TABLE

Kanab Creek and tributaries, from state line to immediately below the confluence with Sink Valley Wash ~~irrigation diversion at confluence with Reservoir Canyon~~	2B	3C	4
Kanab Creek and tributaries, from immediately below the confluence with Sink Valley Wash to the confluence of Simpson Hollow Wash	2B	3C	4*
Kanab Creek and tributaries above Simpson Hollow Wash to irrigation diversion at confluence with Reservoir Canyon	2B	3C	4*
Kanab Creek and tributaries, from			

irrigation diversion at confluence
with Reservoir Canyon to headwaters 2B 3A 4

R317-2-14. Numeric Criteria Table 2.14.1

FOOTNOTE: (4)

Kanab Creek and tributaries above Simpson Hollow Wash to irrigation diversion at confluence with Reservoir Canyon: April through November, daily maximum 1,400 mg/l. Assessments shall be based on TDS concentrations measured in Kanab Creek.

Kanab Creek and tributaries from immediately below the confluence with Sink Valley Wash to the confluence of Simpson Hollow Wash: April through November, daily maximum 1,900 mg/l. December through March, daily maximum 1,700 mg/l. Assessments shall be based on TDS concentrations measured in Kanab Creek.

Protection of Downstream and Existing Uses

The alternative TDS criteria were developed using existing long-term data from monitoring stations on Kanab Creek and are based on ambient conditions that reflect natural conditions as modified by un-alterable human-caused (diversions and irrigation) conditions in the watershed. As upper Kanab Creek flows downstream from its headwaters, water quality is naturally degraded and exacerbated through agricultural irrigation by contact with soils and alluvium derived from saline marine geologic parent material. The stream segments addressed by the alternative TDS criteria show a pattern of increased TDS and decreased flow in a generally downstream progression in upper Kanab Creek. The alternative criteria do not represent an increase in TDS concentrations for upper Kanab Creek because they are based on existing TDS concentrations.

~~The proposed alternative criteria account for these sources of TDS.~~

On a larger scale, upper and lower Kanab Creek watersheds are not hydrologically connected ~~as a continuous waterbody~~ except under flood flow conditions. Review of data shows that upper and lower Kanab Creek are supported by two different baseflow systems and exhibit markedly dissimilar flow and TDS distributions (Figures 16 and 19). When upper and lower Kanab Creek are hydrologically connected during episodes of high flow, TDS concentrations are low in upper Kanab Creek (Figure 14). The TDS concentrations in lower Kanab Creek are consistent over time, further supporting the lack of connection with upper Kanab Creek. No significant additional sources of water are available in upper Kanab Creek to alter the existing hydrologic disconnect.

The implementation of criteria in discharge permits also ensures protection of downstream uses. Permit effluent limits consider impacts to the immediate receiving waters in addition to downstream waters (R317-2-8). The antidegradation reviews required by R317-2-3.5 protect the available assimilative capacity of these waters. Table 9 illustrates a hypothetical (and highly improbable) example of the effect of adding one ton per day of TDS to lower Kanab Creek at the U.S. Highway 89 sample site in lower Kanab Creek. The flow of 5 cfs is conservative because it is based on the 25th percentile for the irrigation season (Figure 16). Under these improbable assumptions, the resulting increase in concentrations is 74 mg/L to the existing median and maximum TDS concentrations at the U.S. Highway 89 site of 314 and 618 mg/l, respectively. ~~The proposed alternative TDS criteria will not adversely impact downstream uses because the criteria are based on ambient~~

conditions and hydrologic connection is infrequentAll of these lines of evidence support that the alternative criteria will not adversely affect downstream uses.

TABLE 9. HYPOTHETICAL EXAMPLE OF 1 TON/DAY OF TDS ADDED TO KANAB CREEK AT THE U.S. HIGHWAY 89 SAMPLE SITE

Flow (cfs)	Flow (l/s)	Flow (l/day)	Additional TDS (ton/day)	Additional TDS (mg/day)	Increase in TDS (mg/l)
5	141.6	$5.1x10^7$	1	$9.1x10^8$	74

TDS = total dissolved solids
cfs = cubic feet/second. 1 cf = 28.3168 L
l/s = liters per second
l/day = liters per day. 1 L/s = 86,400 L/day
mg/day = milligrams per day. 1 ton = $9.1x10^8$ mg
mg/l = milligrams per liter

Assessment Unit Split

The Kane County Water Conservancy District (KCWCD) maintains a large irrigation diversion on Kanab Creek approximately 1 mile north of Kanab (Figure 10). Except in flood flow conditions, all Kanab Creek stream flow is diverted at this point and piped several miles overland to Jackson Flat Reservoir. A small amount of groundwater flow surfaces in Kanab Creek between the diversion and the town of Kanab, but the stream is effectively de-watered below the diversion, and remains so as it exits Utah. The current TDS listing for the lower Kanab Creek 1 assessment unit (AU UT15010003-002_00) is based on data from DWQ Station *Kanab Creek above State Line*, first listed (and carried forward) from 2008. During review of data presented in this report from DWQ station *Kanab Creek at US Highway 89*, it is apparent that the lower listing station above the state line is not representative of water quality conditions in Kanab Creek above the KCWCD diversion.

Based on this major change in hydrology, the current assessment unit,

- Kanab Creek -1 (UT15010003-002_00) Kanab Creek and tributaries from state line to the confluence with Fourmile Hollow near the White Cliffs,

should be split into two separate assessment units as follows:

- Kanab Creek and tributaries from state line to the Kane County Water Conservancy District diversion approximately one mile above Kanab.
- Kanab Creek and tributaries above the Kane County Water Conservancy District Diversion to the confluence with Fourmile Hollow near the White Cliffs

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APPENDIX A PROUCL OUTPUT

Background Statistics for Uncensored Full Data Sets for MLID SW-2

User Selected Options	
Date/Time of Computation	ProUCL 5.12/6/2020 12:26:28 PM
From File	U:\ENG_WQ\CBITTNER\Standards\SiteSpecific\Alton Coal\2020\Data_ProUCL.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	90%
New or Future K Observations	1
Number of Bootstrap Operations	2000

TDS calc (irrig)

General Statistics

Total Number of Observations	26	Number of Distinct Observations	25
Minimum	772	First Quartile	1215
Second Largest	1891	Median	1462
Maximum	2058	Third Quartile	1669
Mean	1451	SD	316.4
Coefficient of Variation	0.218	Skewness	-0.325
Mean of logged Data	7.255	SD of logged Data	0.239

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.824	d2max (for USL)	2.681

Normal GOF Test

Shapiro Wilk Test Statistic	0.98	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.92	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.132	Lilliefors GOF Test
5% Lilliefors Critical Value	0.17	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 90% Coverage	2028	90% Percentile (z)	1857
95% UPL (t)	2002	95% Percentile (z)	1972
95% USL	2300	99% Percentile (z)	2187

Gamma GOF Test

A-D Test Statistic	0.414	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.744	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.163	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.171	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	19.69	k star (bias corrected MLE)	17.45
Theta hat (MLE)	73.7	Theta star (bias corrected MLE)	83.19
nu hat (MLE)	1024	nu star (bias corrected)	907.1
MLE Mean (bias corrected)	1451	MLE Sd (bias corrected)	347.5

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	2082	90% Percentile	1911
95% Hawkins Wixley (HW) Approx. Gamma UPL	2095	95% Percentile	2066
95% WH Approx. Gamma UTL with 90% Coverage	2117	99% Percentile	2379
95% HW Approx. Gamma UTL with 90% Coverage	2132		
95% WH USL	2506	95% HW USL	2544

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.938	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.92	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.177	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.17	Data Not Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 90% Coverage	2186	90% Percentile (z)	1921
95% UPL (t)	2143	95% Percentile (z)	2095
95% USL	2682	99% Percentile (z)	2465

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	25	95% UTL with 90% Coverage	1891
Approx, f used to compute achieved CC	1.389	Approximate Actual Confidence Coefficient achieved by U	0.749
		Approximate Sample Size needed to achieve specified CC	46
95% Percentile Bootstrap UTL with 90% Coverage	1975	95% BCA Bootstrap UTL with 90% Coverage	1975
95% UPL	2000	90% Percentile	1821
90% Chebyshev UPL	2419	95% Percentile	1886
95% Chebyshev UPL	2857	99% Percentile	2016
95% USL	2058		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

TDS calc (nonirrig)

General Statistics			
Total Number of Observations	21	Number of Distinct Observations	20
Minimum	508	First Quartile	760
Second Largest	1790	Median	954
Maximum	2697	Third Quartile	1220
Mean	1056	SD	505.8
Coefficient of Variation	0.479	Skewness	1.841
Mean of logged Data	6.873	SD of logged Data	0.42

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	1.905	d2max (for USL)	2.58

Normal GOF Test			
Shapiro Wilk Test Statistic	0.842	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.908	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.144	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.188	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution			
95% UTL with 90% Coverage	2019	90% Percentile (z)	1704
95% UPL (t)	1949	95% Percentile (z)	1888
95% USL	2361	99% Percentile (z)	2233

Gamma GOF Test

A-D Test Statistic	0.314	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.745	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.114	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.19	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics			
k hat (MLE)	5.748	k star (bias corrected MLE)	4.958
Theta hat (MLE)	183.7	Theta star (bias corrected MLE)	212.9
nu hat (MLE)	241.4	nu star (bias corrected)	208.2
MLE Mean (bias corrected)	1056	MLE Sd (bias corrected)	474.2

Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	1971	90% Percentile	1691
95% Hawkins Wixley (HW) Approx. Gamma UPL	1981	95% Percentile	1937
95% WH Approx. Gamma UTL with 90% Coverage	2068	99% Percentile	2458
95% HW Approx. Gamma UTL with 90% Coverage	2083		
95% WH USL	2582	95% HW USL	2634

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.971	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.908	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.097	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.188	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 90% Coverage	2149	90% Percentile (z)	1654
95% UPL (t)	2027	95% Percentile (z)	1927
95% USL	2855	99% Percentile (z)	2566

Nonparametric Distribution Free Background Statistics
Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	21	95% UTL with 90% Coverage	2697
Approx, f used to compute achieved CC	2.333	Approximate Actual Confidence Coefficient achieved by U	0.891
		Approximate Sample Size needed to achieve specified CC	29
95% Percentile Bootstrap UTL with 90% Coverage	2697	95% BCA Bootstrap UTL with 90% Coverage	1790
95% UPL	2606	90% Percentile	1511
90% Chebyshev UPL	2609	95% Percentile	1790
95% Chebyshev UPL	3313	99% Percentile	2515
95% USL	2697		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Uncensored Full Data Sets for MLID 4951940

User Selected Options	
Date/Time of Computation	ProUCL 5.12/6/2020 12:28:59 PM
From File	U:\ENG_WQ\CBITTNER\Standards\SiteSpecific\Alton Coal\2020\Data_ProUCL.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	90%
New or Future K Observations	1
Number of Bootstrap Operations	2000

TDS calc (irrig)

General Statistics

Total Number of Observations	26	Number of Distinct Observations	26
Minimum	428	First Quartile	871
Second Largest	1350	Median	1050
Maximum	1440	Third Quartile	1119
Mean	1013	SD	217.3
Coefficient of Variation	0.214	Skewness	-0.356
Mean of logged Data	6.895	SD of logged Data	0.244

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.824	d2max (for USL)	2.681

Normal GOF Test

Shapiro Wilk Test Statistic	0.969	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.92	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.103	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.17	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 90% Coverage	1410	90% Percentile (z)	1292
95% UPL (t)	1392	95% Percentile (z)	1371
95% USL	1596	99% Percentile (z)	1519

Gamma GOF Test

A-D Test Statistic	0.485	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.744	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.127	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.171	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	19.57	k star (bias corrected MLE)	17.33
Theta hat (MLE)	51.79	Theta star (bias corrected MLE)	58.46
nu hat (MLE)	1017	nu star (bias corrected)	901.4
MLE Mean (bias corrected)	1013	MLE Sd (bias corrected)	243.4

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1455	90% Percentile	1335
95% Hawkins Wixley (HW) Approx. Gamma UPL	1466	95% Percentile	1444
95% WH Approx. Gamma UTL with 90% Coverage	1480	99% Percentile	1664
95% HW Approx. Gamma UTL with 90% Coverage	1492		
95% WH USL	1752	95% HW USL	1782

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.891	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.92	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.135	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.17	Data appear Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 90% Coverage	1540	90% Percentile (z)	1350
95% UPL (t)	1509	95% Percentile (z)	1474
95% USL	1898	99% Percentile (z)	1741

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	25	95% UTL with 90% Coverage	1350
Approx, f used to compute achieved CC	1.389	Approximate Actual Confidence Coefficient achieved by U	0.749
		Approximate Sample Size needed to achieve specified CC	46
95% Percentile Bootstrap UTL with 90% Coverage	1395	95% BCA Bootstrap UTL with 90% Coverage	1390
95% UPL	1409	90% Percentile	1299
90% Chebyshev UPL	1678	95% Percentile	1348
95% Chebyshev UPL	1979	99% Percentile	1418
95% USL	1440		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

TDS calc (nonirrig)

General Statistics			
Total Number of Observations	16	Number of Distinct Observations	16
Minimum	386	First Quartile	445.5
Second Largest	824	Median	487
Maximum	936	Third Quartile	531
Mean	527.1	SD	149.5
Coefficient of Variation	0.284	Skewness	1.982
Mean of logged Data	6.237	SD of logged Data	0.241

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.033	d2max (for USL)	2.443

Normal GOF Test			
Shapiro Wilk Test Statistic	0.75	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.887	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.28	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.213	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution			
95% UTL with 90% Coverage	831.1	90% Percentile (z)	718.7
95% UPL (t)	797.3	95% Percentile (z)	773
95% USL	892.4	99% Percentile (z)	874.9

Gamma GOF Test

A-D Test Statistic	1.195	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.737	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.252	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.215	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	16.74	k star (bias corrected MLE)	13.64
Theta hat (MLE)	31.5	Theta star (bias corrected MLE)	38.65
nu hat (MLE)	535.5	nu star (bias corrected)	436.4
MLE Mean (bias corrected)	527.1	MLE Sd (bias corrected)	142.7
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	791.4	90% Percentile	716.3
95% Hawkins Wixley (HW) Approx. Gamma UPL	790.9	95% Percentile	781.7
95% WH Approx. Gamma UTL with 90% Coverage	831.5	99% Percentile	914.6
95% HW Approx. Gamma UTL with 90% Coverage	832		
95% WH USL	907.6	95% HW USL	910.5
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.84	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.887	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.235	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.213	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 90% Coverage	834.1	90% Percentile (z)	696.2
95% UPL (t)	790	95% Percentile (z)	759.8
95% USL	920.7	99% Percentile (z)	895.1
Nonparametric Distribution Free Background Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	16	95% UTL with 90% Coverage	936
Approx, f used to compute achieved CC	1.778	Approximate Actual Confidence Coefficient achieved by U	0.815
		Approximate Sample Size needed to achieve specified CC	29
95% Percentile Bootstrap UTL with 90% Coverage	936	95% BCA Bootstrap UTL with 90% Coverage	936
95% UPL	936	90% Percentile	704
90% Chebyshev UPL	989.4	95% Percentile	852
95% Chebyshev UPL	1199	99% Percentile	919.2
95% USL	936		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Uncensored Full Data Sets for MLID SW-1

User Selected Options	
Date/Time of Computation	ProUCL 5.12/6/2020 12:29:58 PM
From File	U:\ENG_WQ\CBITTNER\Standards\SiteSpecific\Alton Coal\2020\Data_ProUCL.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	90%
New or Future K Observations	1
Number of Bootstrap Operations	2000

TDS calc (irrig)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	22
Minimum	578	First Quartile	1018
Second Largest	1350	Median	1095
Maximum	1474	Third Quartile	1276
Mean	1114	SD	193.5
Coefficient of Variation	0.174	Skewness	-0.719
Mean of logged Data	6.999	SD of logged Data	0.195

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.869	d2max (for USL)	2.624

Normal GOF Test

Shapiro Wilk Test Statistic	0.949	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.914	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.108	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.18	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 90% Coverage	1475	90% Percentile (z)	1362
95% UPL (t)	1453	95% Percentile (z)	1432
95% USL	1622	99% Percentile (z)	1564

Gamma GOF Test

A-D Test Statistic	0.609	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.128	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	30.06	k star (bias corrected MLE)	26.17
Theta hat (MLE)	37.05	Theta star (bias corrected MLE)	42.56
nu hat (MLE)	1383	nu star (bias corrected)	1204
MLE Mean (bias corrected)	1114	MLE Sd (bias corrected)	217.7

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1504	90% Percentile	1400
95% Hawkins Wixley (HW) Approx. Gamma UPL	1513	95% Percentile	1494
95% WH Approx. Gamma UTL with 90% Coverage	1533	99% Percentile	1682
95% HW Approx. Gamma UTL with 90% Coverage	1543		
95% WH USL	1736	95% HW USL	1756

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.877	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.914	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.147	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.18	Data appear Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 90% Coverage	1578	90% Percentile (z)	1407
95% UPL (t)	1543	95% Percentile (z)	1511
95% USL	1829	99% Percentile (z)	1726

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	22	95% UTL with 90% Coverage	1350
Approx, f used to compute achieved CC	1.222	Approximate Actual Confidence Coefficient achieved by U	0.685
		Approximate Sample Size needed to achieve specified CC	46
95% Percentile Bootstrap UTL with 90% Coverage	1449	95% BCA Bootstrap UTL with 90% Coverage	1438
95% UPL	1449	90% Percentile	1293
90% Chebyshev UPL	1707	95% Percentile	1344
95% Chebyshev UPL	1975	99% Percentile	1447
95% USL	1474		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

TDS calc (nonirrig)

General Statistics			
Total Number of Observations	12	Number of Distinct Observations	12
Minimum	404	First Quartile	511
Second Largest	920	Median	565.3
Maximum	1238	Third Quartile	727.2
Mean	652.6	SD	237.7
Coefficient of Variation	0.364	Skewness	1.497
Mean of logged Data	6.429	SD of logged Data	0.326

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.21	d2max (for USL)	2.285

Normal GOF Test			
Shapiro Wilk Test Statistic	0.865	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.206	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.243	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution			
95% UTL with 90% Coverage	1178	90% Percentile (z)	957.3
95% UPL (t)	1097	95% Percentile (z)	1044
95% USL	1196	99% Percentile (z)	1206

Gamma GOF Test

A-D Test Statistic	0.38	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.73	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.187	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.245	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics			
k hat (MLE)	9.775	k star (bias corrected MLE)	7.387
Theta hat (MLE)	66.76	Theta star (bias corrected MLE)	88.35
nu hat (MLE)	234.6	nu star (bias corrected)	177.3
MLE Mean (bias corrected)	652.6	MLE Sd (bias corrected)	240.1

Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	1118	90% Percentile	973
95% Hawkins Wixley (HW) Approx. Gamma UPL	1122	95% Percentile	1091
95% WH Approx. Gamma UTL with 90% Coverage	1227	99% Percentile	1336
95% HW Approx. Gamma UTL with 90% Coverage	1237		
95% WH USL	1253	95% HW USL	1264

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.946	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.167	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.243	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 90% Coverage	1273	90% Percentile (z)	940.7
95% UPL (t)	1139	95% Percentile (z)	1059
95% USL	1305	99% Percentile (z)	1322

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	12	95% UTL with 90% Coverage	1238
Approx, f used to compute achieved CC	1.333	Approximate Actual Confidence Coefficient achieved by U	0.718
		Approximate Sample Size needed to achieve specified CC	29
95% Percentile Bootstrap UTL with 90% Coverage	1238	95% BCA Bootstrap UTL with 90% Coverage	1206
95% UPL	1238	90% Percentile	904.8
90% Chebyshev UPL	1395	95% Percentile	1063
95% Chebyshev UPL	1731	99% Percentile	1203
95% USL	1238		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Uncensored Full Data Sets for MLID SW-3

User Selected Options	
Date/Time of Computation	ProUCL 5.12/6/2020 12:27:49 PM
From File	U:\ENG_WQ\CBITTNER\Standards\SiteSpecific\Alton Coal\2020\Data_ProUCL.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	90%
New or Future K Observations	1
Number of Bootstrap Operations	2000

TDS calc (irrig)

General Statistics

Total Number of Observations	32	Number of Distinct Observations	31
Minimum	452	First Quartile	890.2
Second Largest	1358	Median	1085
Maximum	1372	Third Quartile	1252
Mean	1043	SD	258.8
Coefficient of Variation	0.248	Skewness	-0.835
Mean of logged Data	6.913	SD of logged Data	0.295

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.748	d2max (for USL)	2.773

Normal GOF Test

Shapiro Wilk Test Statistic	0.909	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.93	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.12	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.154	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 90% Coverage	1496	90% Percentile (z)	1375
95% UPL (t)	1489	95% Percentile (z)	1469
95% USL	1761	99% Percentile (z)	1645

Gamma GOF Test

A-D Test Statistic	1.404	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.746	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.157	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.155	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	13.56	k star (bias corrected MLE)	12.31
Theta hat (MLE)	76.91	Theta star (bias corrected MLE)	84.73
nu hat (MLE)	868.1	nu star (bias corrected)	788
MLE Mean (bias corrected)	1043	MLE Sd (bias corrected)	297.3

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1588	90% Percentile	1438
95% Hawkins Wixley (HW) Approx. Gamma UPL	1606	95% Percentile	1575
95% WH Approx. Gamma UTL with 90% Coverage	1598	99% Percentile	1856
95% HW Approx. Gamma UTL with 90% Coverage	1616		
95% WH USL	2023	95% HW USL	2074

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.848	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.93	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.176	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.154	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 90% Coverage	1683	90% Percentile (z)	1467
95% UPL (t)	1670	95% Percentile (z)	1632
95% USL	2277	99% Percentile (z)	1996

Nonparametric Distribution Free Background Statistics
Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	31	95% UTL with 90% Coverage	1358
Approx, f used to compute achieved CC	1.722	Approximate Actual Confidence Coefficient achieved by U	0.844
		Approximate Sample Size needed to achieve specified CC	46
95% Percentile Bootstrap UTL with 90% Coverage	1358	95% BCA Bootstrap UTL with 90% Coverage	1355
95% UPL	1363	90% Percentile	1312
90% Chebyshev UPL	1832	95% Percentile	1340
95% Chebyshev UPL	2189	99% Percentile	1368
95% USL	1372		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

TDS calc (nonirrig)

General Statistics			
Total Number of Observations	25	Number of Distinct Observations	24
Minimum	388	First Quartile	476
Second Largest	1120	Median	589.6
Maximum	1167	Third Quartile	748
Mean	641.3	SD	224.6
Coefficient of Variation	0.35	Skewness	1.153
Mean of logged Data	6.412	SD of logged Data	0.32

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	1.838	d2max (for USL)	2.663

Normal GOF Test			
Shapiro Wilk Test Statistic	0.858	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.918	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.232	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.173	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution			
95% UTL with 90% Coverage	1054	90% Percentile (z)	929.1
95% UPL (t)	1033	95% Percentile (z)	1011
95% USL	1239	99% Percentile (z)	1164

Gamma GOF Test

A-D Test Statistic	0.855	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.745	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.195	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.175	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics			
k hat (MLE)	9.808	k star (bias corrected MLE)	8.658
Theta hat (MLE)	65.38	Theta star (bias corrected MLE)	74.07
nu hat (MLE)	490.4	nu star (bias corrected)	432.9
MLE Mean (bias corrected)	641.3	MLE Sd (bias corrected)	217.9

Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	1048	90% Percentile	931.6
95% Hawkins Wixley (HW) Approx. Gamma UPL	1051	95% Percentile	1037
95% WH Approx. Gamma UTL with 90% Coverage	1075	99% Percentile	1254
95% HW Approx. Gamma UTL with 90% Coverage	1080		
95% WH USL	1338	95% HW USL	1356

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.924	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.918	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.174	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.173	Data Not Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 90% Coverage	1095	90% Percentile (z)	917
95% UPL (t)	1063	95% Percentile (z)	1030
95% USL	1426	99% Percentile (z)	1280

Nonparametric Distribution Free Background Statistics			
Data appear Approximate Lognormal at 5% Significance Level			

Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	24	95% UTL with 90% Coverage	1120
Approx, f used to compute achieved CC	1.333	Approximate Actual Confidence Coefficient achieved by U	0.729
		Approximate Sample Size needed to achieve specified CC	46
95% Percentile Bootstrap UTL with 90% Coverage	1148	95% BCA Bootstrap UTL with 90% Coverage	1120
95% UPL	1153	90% Percentile	1010
90% Chebyshev UPL	1328	95% Percentile	1102
95% Chebyshev UPL	1640	99% Percentile	1156
95% USL	1167		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
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and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Uncensored Full Data Sets MLID 4951830

User Selected Options	
Date/Time of Computation	ProUCL 5.12/6/2020 12:23:58 PM
From File	U:\ENG_WQ\CBITTNER\Standards\SiteSpecific\Alton Coal\2020\Data_ProUCL.xlsx
Full Precision	OFF
Confidence Coefficient	1
Coverage	1
New or Future K Observations	1
Number of Bootstrap Operations	2000

TDS calc (irrig)

General Statistics			
Total Number of Observations	76	Number of Distinct Observations	71
Minimum	372	First Quartile	855.5
Second Largest	1686	Median	1365
Maximum	2536	Third Quartile	1488
Mean	1196	SD	393.8
Coefficient of Variation	0.329	Skewness	0.0658
Mean of logged Data	7.024	SD of logged Data	0.376

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	1.564	d2max (for USL)	3.114

Normal GOF Test		
Shapiro Wilk Test Statistic	0.931	Normal GOF Test
5% Shapiro Wilk P Value	4.33E-04	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.176	Lilliefors GOF Test
5% Lilliefors Critical Value	1.02E-01	Data Not Normal at 5% Significance Level
Data Not Normal at 5% Significance Level		

Background Statistics Assuming Normal Distribution			
95% UTL with 90% Coverage	1812	90% Percentile (z)	1701
95% UPL (t)	1856	95% Percentile (z)	1844
95% USL	2422	99% Percentile (z)	2112

Gamma GOF Test		
A-D Test Statistic	2.559	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.752	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0	Data Not Gamma Distributed at 5% Significance Level
Data Not Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	8.147	k star (bias corrected MLE)	7.834
Theta hat (MLE)	146.8	Theta star (bias corrected MLE)	152.7
nu hat (MLE)	1.24E+03	nu star (bias corrected)	1191
MLE Mean (bias corrected)	1196	MLE Sd (bias corrected)	427.3

Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	1983	90% Percentile	1766
95% Hawkins Wixley (HW) Approx. Gamma UPL	2009	95% Percentile	1975
95% WH Approx. Gamma UTL with 90% Coverage	1918	99% Percentile	2407
95% HW Approx. Gamma UTL with 90% Coverage	1939		
95% WH USL	2959	95% HW USL	3081

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.901	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	1.93E-06	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.205	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.102	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 90% Coverage	2021	90% Percentile (z)	1818
95% UPL (t)	2109	95% Percentile (z)	2084
95% USL	3617	99% Percentile (z)	2691

Nonparametric Distribution Free Background Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	72	95% UTL with 90% Coverage	1654
Approx, f used to compute achieved CC	2	Approximate Actual Confidence Coefficient achieved by U	0.888
		Approximate Sample Size needed to achieve specified CC	89
95% Percentile Bootstrap UTL with 90% Coverage	1654	95% BCA Bootstrap UTL with 90% Coverage	1654
95% UPL	1656	90% Percentile	1576
90% Chebyshev UPL	2385	95% Percentile	1655
95% Chebyshev UPL	2924	99% Percentile	1899
95% USL	2536		

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TDS calc (nonirrig)

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	32
Minimum	534	First Quartile	752
Second Largest	1716	Median	816
Maximum	1808	Third Quartile	1306
Mean	1013	SD	365.2
Coefficient of Variation	0.36	Skewness	0.689
Mean of logged Data	6.861	SD of logged Data	0.348

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	1.74	d2max (for USL)	2.787

Normal GOF Test			
Shapiro Wilk Test Statistic	0.892	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.931	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.221	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.152	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution			
95% UTL with 90% Coverage	1649	90% Percentile (z)	1481
95% UPL (t)	1641	95% Percentile (z)	1614
95% USL	2031	99% Percentile (z)	1863

Gamma GOF Test

A-D Test Statistic	1	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.748	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.204	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics			
k hat (MLE)	9	k star (bias corrected MLE)	7.749
Theta hat (MLE)	119.2	Theta star (bias corrected MLE)	130.8
nu hat (MLE)	561	nu star (bias corrected)	511.4
MLE Mean (bias corrected)	1013	MLE Sd (bias corrected)	364

Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	1693	90% Percentile	1499
95% Hawkins Wixley (HW) Approx. Gamma UPL	1702	95% Percentile	1677
95% WH Approx. Gamma UTL with 90% Coverage	1703	99% Percentile	2046
95% HW Approx. Gamma UTL with 90% Coverage	1713		
95% WH USL	2281	95% HW USL	2330

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.931	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.189	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.152	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 90% Coverage	1749	90% Percentile (z)	1491
95% UPL (t)	1737	95% Percentile (z)	1692
95% USL	2518	99% Percentile (z)	2145

Nonparametric Distribution Free Background Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	32	95% UTL with 90% Coverage	1716
Approx, f used to compute achieved CC	1.778	Approximate Actual Confidence Coefficient achieved by U	0.856
		Approximate Sample Size needed to achieve specified CC	46
95% Percentile Bootstrap UTL with 90% Coverage	1681	95% BCA Bootstrap UTL with 90% Coverage	1716
95% UPL	1744	90% Percentile	1539
90% Chebyshev UPL	2125	95% Percentile	1610
95% Chebyshev UPL	2629	99% Percentile	1779
95% USL	1808		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
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The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

APPENDIX B TRIMMED TDS DATA FOR KANAB CK

TEST	SITENAME	SITE	DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	1/30/2013	1	NonIrrig	2:25:00 PM	819	1346.50	490.00	490
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	2/25/2013	2	NonIrrig	11:55:00 AM	865	1570.91	516.00	516
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	3/23/2013	3	NonIrrig	2:00:00 PM	778	1795.33	444.00	444
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	4/22/2013	4	Irrig	4:20:00 PM	1390	224.42	944.00	944
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	5/27/2013	5	Irrig	3:50:00 PM	1171	224.42	#N/A	880
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	6/28/2013	6	Irrig	12:00:00 PM	1440	89.77	#N/A	1082
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	7/29/2013	7	Irrig	2:20:00 PM	708	897.67	428.00	428
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	8/29/2013	8	Irrig	3:30:00 PM	1477	134.65	#N/A	1110
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	9/23/2013	9	Irrig	3:15:00 PM	1159	336.62	#N/A	871
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	10/30/2013	10	Irrig	8:30:00 AM	1206	673.25	828.00	828
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	11/18/2013	11	Irrig	5:00:00 PM	296	448.83	742.00	742
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	1/1/2014	1	NonIrrig	4:00:00 PM	241	2468.58	428.00	428
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	1/30/2014	1	NonIrrig	3:10:00 PM	854	2244.16	446.00	446
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	2/25/2014	2	NonIrrig	11:30:00 AM	774	2244.16	458.00	458
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	3/26/2014	3	NonIrrig	4:15:00 PM	1325	314.18	936.00	936
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	4/28/2014	4	Irrig	2:00:00 PM	1571	359.07	1122.00	1122
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	5/28/2014	5	Irrig	3:10:00 PM	1476	134.65	1052.00	1052
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	7/28/2014	7	Irrig	2:00:00 PM	1743	44.88	1440.00	1440
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	8/25/2014	8	Irrig	4:40:00 PM	1563	89.77	1130.00	1130
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	10/28/2014	10	Irrig	2:30:00 PM	1195	359.07	830.00	830
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	11/28/2014	11	Irrig	11:30:00 AM	1294	359.07	872.00	872
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	1/6/2015	1	NonIrrig	2:50:00 PM	684	1346.50	398.00	398
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	2/9/2015	2	NonIrrig	3:40:00 PM	678	1346.50	386.00	386
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	3/10/2015	3	NonIrrig	1:30:00 PM	841	4488.33	512.00	512
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	4/29/2015	4	Irrig	9:50:00 AM	1497	179.53	1054.00	1054
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	6/8/2015	6	Irrig	1:50:00 PM	1419	224.42	992.00	992
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	7/28/2015	7	Irrig	3:35:00 PM	1556	89.77	1186.00	1186
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	8/24/2015	8	Irrig	2:50:00 PM	1138	134.65	1258.00	1258
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	11/27/2015	11	Irrig	2:15:00 PM	1190	359.07	792.00	792
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	1/19/2016	1	NonIrrig	11:50:00 AM	794	448.83	484.00	484
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	2/23/2016	2	NonIrrig	10:30:00 AM	930	1346.50	584.00	584
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	3/9/2016	3	NonIrrig	12:00:00 AM	783	1757.00	456.00	456
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	3/29/2016	3	NonIrrig	11:40:00 AM	815	1346.50	496.00	496
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	4/25/2016	4	Irrig	3:50:00 PM	1452	224.42	1048.00	1048
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	5/28/2016	5	Irrig	3:50:00 PM	1408	224.42	1072.00	1072
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	6/4/2016	6	Irrig	12:00:00 AM	1488	134.00	1100.00	1100
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	7/27/2016	7	Irrig	3:30:00 PM	1742	89.77	1350.00	1350
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	8/29/2016	8	Irrig	2:05:00 PM	1256	179.53	820.00	820
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	9/11/2016	9	Irrig	12:00:00 AM	#N/A	38.00	1340.00	1340
	Kanab Ck at Xing BL Alton	4951940	9/26/2016	9	Irrig	2:05:00 PM	1340	#N/A	#N/A	1007
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	12/27/2016	12	NonIrrig	12:00:00 AM	862	1186.00	576.00	576
COAL HOLLOW	Kanab Ck at Xing BL Alton	4951940	3/30/2017	3	NonIrrig	12:00:00 AM	1215	597.00	824.00	824
COAL HOLLOW	SW-1	Kanab Creek	12/30/2017	12	NonIrrig	12:00:00 AM	1231	296.00	920.00	920
COAL HOLLOW	SW-1	Kanab Creek	9/19/2017	9	Irrig	12:00:00 AM	1375	62.00	1050.00	1050

TEST	SITENAME	SITE	DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
COAL HOLLOW	SW-1	Kanab Creek	6/17/2017	6	Irrig	12:00:00 AM	1550	78.00	1280.00	1280
COAL HOLLOW	SW-1	Kanab Creek	3/30/2017	3	NonIrrig	12:00:00 AM	1171	684.00	768.00	768
COAL HOLLOW	SW-1	Kanab Creek	12/27/2016	12	NonIrrig	12:00:00 AM	807	1575.00	540.00	540
COAL HOLLOW	SW-1	Kanab Creek	9/11/2016	9	Irrig	12:00:00 AM	1499	28.50	1100.00	1100
COAL HOLLOW	SW-1	Kanab Creek	6/4/2016	6	Irrig	12:00:00 AM	1478	88.20	1060.00	1060
COAL HOLLOW	SW-1	Kanab Creek	3/9/2016	3	NonIrrig	12:00:00 AM	752	2560.00	404.00	404
COAL HOLLOW	SW-1	Kanab Creek	8/23/2015	8	Irrig	12:00:00 AM	#N/A	0.00	976.00	976
COAL HOLLOW	SW-1	Kanab Creek	11/16/2009	11	Irrig	12:00:00 AM	1390	321.00	#N/A	1044
COAL HOLLOW	SW-1	Kanab Creek	9/29/2009	9	Irrig	12:00:00 AM	1716	15.30	#N/A	1289
COAL HOLLOW	SW-1	Kanab Creek	5/26/2009	5	Irrig	12:00:00 AM	1522	101.00	1207.00	1207
COAL HOLLOW	SW-1	Kanab Creek	8/21/2008	8	Irrig	12:00:00 AM	1601	25.40	1230.00	1230
COAL HOLLOW	SW-1	Kanab Creek	6/18/2008	6	Irrig	12:00:00 AM	1723	87.70	1271.00	1271
COAL HOLLOW	SW-1	Kanab Creek	12/30/2007	12	NonIrrig	12:00:00 AM	520	703.00	454.00	454
COAL HOLLOW	SW-1	Kanab Creek	9/29/2007	9	Irrig	12:00:00 AM	1369	67.90	1095.00	1095
COAL HOLLOW	SW-1	Kanab Creek	6/22/2007	6	Irrig	12:00:00 AM	1685	27.10	1350.00	1350
COAL HOLLOW	SW-1	Kanab Creek	3/29/2007	3	NonIrrig	12:00:00 AM	1592	172.00	1238.00	1238
COAL HOLLOW	SW-1	Kanab Creek	12/30/2006	12	NonIrrig	12:00:00 AM	738	300.00	442.00	442
COAL HOLLOW	SW-1	Kanab Creek	9/7/2006	9	Irrig	12:00:00 AM	1579	115.00	1292.00	1292
COAL HOLLOW	SW-1	Kanab Creek	5/30/2006	5	Irrig	12:00:00 AM	1544	158.00	815.00	815
COAL HOLLOW	SW-1	Kanab Creek	3/31/2006	3	NonIrrig	12:00:00 AM	846	2770.00	530.00	530
COAL HOLLOW	SW-1	Kanab Creek	11/3/2005	11	Irrig	12:00:00 AM	1551	893.00	1085.00	1085
COAL HOLLOW	SW-1	Kanab Creek	9/25/2005	9	Irrig	12:00:00 AM	1962	161.00	#N/A	1474
COAL HOLLOW	SW-1	Kanab Creek	9/25/2005	9	Irrig	12:00:00 AM	1962	161.00	1293.00	1293
COAL HOLLOW	SW-1	Kanab Creek	5/27/2005	5	Irrig	12:00:00 AM	813	1830.00	578.00	578
COAL HOLLOW	SW-1	Kanab Creek	3/17/1988	3	NonIrrig	12:00:00 AM	920	3280.00	#N/A	691
COAL HOLLOW	SW-1	Kanab Creek	2/20/1988	2	NonIrrig	12:00:00 AM	770	3190.00	#N/A	578
COAL HOLLOW	SW-1	Kanab Creek	1/15/1988	1	NonIrrig	12:00:00 AM	735	3460.00	#N/A	552
COAL HOLLOW	SW-1	Kanab Creek	12/8/1987	12	NonIrrig	12:00:00 AM	950	449.00	#N/A	714
COAL HOLLOW	SW-1	Kanab Creek	11/13/1987	11	Irrig	12:00:00 AM	1510	390.00	#N/A	1134
COAL HOLLOW	SW-1	Kanab Creek	10/26/1987	10	Irrig	12:00:00 AM	1260	206.00	#N/A	947
COAL HOLLOW	SW-1	Kanab Creek	9/4/1987	9	Irrig	12:00:00 AM	1415	144.00	#N/A	1063
COAL HOLLOW	SW-1	Kanab Creek	8/3/1987	8	Irrig	12:00:00 AM	1320	117.00	#N/A	992
COAL HOLLOW	SW-1	Kanab Creek	7/1/1987	7	Irrig	12:00:00 AM	1320	45.00	#N/A	992
COAL HOLLOW	SW-101	Robinson Creek	12/28/2017	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	9/20/2017	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	6/17/2017	6	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	3/30/2017	3	NonIrrig	12:00:00 AM	3412	0.15	#N/A	3240.5028
COAL HOLLOW	SW-101	Robinson Creek	12/28/2016	12	NonIrrig	12:00:00 AM	1314	3.37	#N/A	1175.2316
COAL HOLLOW	SW-101	Robinson Creek	9/8/2016	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	6/5/2016	6	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	3/3/2016	3	NonIrrig	12:00:00 AM	3316	0.69	#N/A	3146.0004
COAL HOLLOW	SW-101	Robinson Creek	12/10/2015	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	8/19/2015	8	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	6/28/2015	6	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A

TEST	SITENAME	SITE	DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
COAL HOLLOW	SW-101	Robinson Creek	3/30/2015	3	NonIrrig	12:00:00 AM	2640	0.37	#N/A	2480.546
COAL HOLLOW	SW-101	Robinson Creek	12/20/2014	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	9/29/2014	9	Irrig	12:00:00 AM	1163	4.99	#N/A	1097.872
COAL HOLLOW	SW-101	Robinson Creek	6/15/2014	6	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	3/28/2014	3	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	12/19/2013	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	9/28/2013	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	6/2/2013	6	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	3/12/2013	3	NonIrrig	12:00:00 AM	3550	2.67	#N/A	3376.35
COAL HOLLOW	SW-101	Robinson Creek	12/12/2012	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	9/29/2012	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	9/28/2012	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	5/8/2012	5	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	3/30/2012	3	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	12/20/2011	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	9/6/2011	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	6/1/2011	6	Irrig	12:00:00 AM	3250	0.00	#N/A	3081.03
COAL HOLLOW	SW-101	Robinson Creek	3/26/2011	3	NonIrrig	12:00:00 AM	2220	63.40	#N/A	2067.098
COAL HOLLOW	SW-101	Robinson Creek	12/8/2010	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	10/5/2010	10	Irrig	12:00:00 AM	817	8080.00	696.00	696
COAL HOLLOW	SW-101	Robinson Creek	9/27/2010	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	5/14/2010	5	Irrig	12:00:00 AM	3870	0.05	3751.00	3751
COAL HOLLOW	SW-101	Robinson Creek	5/13/2010	5	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	5/12/2010	5	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	5/7/2010	5	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	5/6/2010	5	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	5/6/2010	5	Irrig	12:00:00 AM	3510	0.01	3429.00	3429
COAL HOLLOW	SW-101	Robinson Creek	5/6/2010	5	Irrig	12:00:00 AM	3510	0.05	3429.00	3429
COAL HOLLOW	SW-101	Robinson Creek	5/6/2010	5	Irrig		3510	0.05	#N/A	3336.974
COAL HOLLOW	SW-101	Robinson Creek	4/23/2010	4	Irrig	12:00:00 AM	#N/A	0.05	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	4/22/2010	4	Irrig	12:00:00 AM	#N/A	3.16	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	4/22/2010	4	Irrig	12:00:00 AM	2780	3.08	2398.00	2398
COAL HOLLOW	SW-101	Robinson Creek	3/31/2010	3	NonIrrig	12:00:00 AM	1345	81.00	1056.00	1056
COAL HOLLOW	SW-101	Robinson Creek	3/30/2010	3	NonIrrig	12:00:00 AM	577	798.00	472.00	472
COAL HOLLOW	SW-101	Robinson Creek	11/17/2009	11	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	9/29/2009	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	5/24/2009	5	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	3/20/2009	3	NonIrrig	12:00:00 AM	#N/A	2.96	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	3/18/2009	3	NonIrrig	12:00:00 AM	2530	16.10	2228.00	2228
COAL HOLLOW	SW-101	Robinson Creek	3/17/2009	3	NonIrrig	12:00:00 AM	2560	18.50	#N/A	2401.794
COAL HOLLOW	SW-101	Robinson Creek	12/30/2008	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	12/10/2008	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	8/20/2008	8	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	7/27/2008	7	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A

TEST	SITENAME	SITE	DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
COAL HOLLOW	SW-101	Robinson Creek	6/17/2008	6	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	3/21/2008	3	NonIrrig	12:00:00 AM	531	777.00	644.00	644
COAL HOLLOW	SW-101	Robinson Creek	12/29/2007	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	11/26/2007	11	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	9/29/2007	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	6/20/2007	6	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	12/30/2006	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	12/21/2006	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	5/3/2006	5	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	3/31/2006	3	NonIrrig	12:00:00 AM	3120	20.80	3012.00	3012
COAL HOLLOW	SW-101	Robinson Creek	11/3/2005	11	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	9/24/2005	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	#N/A
COAL HOLLOW	SW-101	Robinson Creek	5/27/2005	5	Irrig	12:00:00 AM	495	734.00	309.00	309
COAL HOLLOW	SW-1A	Kanab Creek above North Lease	12/12/2017	12	NonIrrig	12:00:00 AM	1159	141.00	#N/A	871
COAL HOLLOW	SW-1A	Kanab Creek above North Lease	9/20/2017	9	Irrig	12:00:00 AM	1380	58.00	#N/A	1037
COAL HOLLOW	SW-1A	Kanab Creek above North Lease	6/17/2017	6	Irrig	12:00:00 AM	1599	81.00	#N/A	1201
COAL HOLLOW	SW-1A	Kanab Creek above North Lease	3/31/2017	3	NonIrrig	12:00:00 AM	1199	811.00	#N/A	901
COAL HOLLOW	SW-1A	Kanab Creek above North Lease	12/27/2016	12	NonIrrig	12:00:00 AM	799	1240.00	#N/A	600
COAL HOLLOW	SW-1A	Kanab Creek above North Lease	9/11/2016	9	Irrig	12:00:00 AM	1354	18.50	#N/A	1017
COAL HOLLOW	SW-1A	Kanab Creek above North Lease	6/5/2016	6	Irrig	12:00:00 AM	1484	130.00	#N/A	1115
COAL HOLLOW	SW-1A	Kanab Creek above North Lease	3/9/2016	3	NonIrrig	12:00:00 AM	733	3020.00	#N/A	551
COAL HOLLOW	SW-1M		12/30/2017	12	NonIrrig	12:00:00 AM	1212	258.00	884.00	884
COAL HOLLOW	SW-1M		9/19/2017	9	Irrig	12:00:00 AM	1325	53.00	956.00	956
COAL HOLLOW	SW-1M		6/17/2017	6	Irrig	12:00:00 AM	1506	63.00	1220.00	1220
COAL HOLLOW	SW-1M		3/30/2017	3	NonIrrig	12:00:00 AM	1168	537.00	816.00	816
COAL HOLLOW	SW-1M		12/27/2016	12	NonIrrig	12:00:00 AM	823	1802.00	512.00	512
COAL HOLLOW	SW-1M		9/11/2016	9	Irrig	12:00:00 AM	1404	23.90	1020.00	1020
COAL HOLLOW	SW-1M		6/4/2016	6	Irrig	12:00:00 AM	1390	96.00	980.00	980
COAL HOLLOW	SW-1M		3/9/2016	3	NonIrrig	12:00:00 AM	742	2665.00	420.00	420
COAL HOLLOW	SW-2	Kanab Creek	12/30/2017	12	NonIrrig	12:00:00 AM	2119	21.00	1790.00	1790
COAL HOLLOW	SW-2	Kanab Creek	3/29/2017	3	NonIrrig	12:00:00 AM	1464	441.00	1120.00	1120
COAL HOLLOW	SW-2	Kanab Creek	12/20/2016	12	NonIrrig	12:00:00 AM	883	3348.00	596.00	596
COAL HOLLOW	SW-2	Kanab Creek	3/11/2016	3	NonIrrig	12:00:00 AM	890	2650.00	508.00	508
COAL HOLLOW	SW-2	Kanab Creek	12/8/2015	12	NonIrrig	12:00:00 AM	1769	610.00	1320.00	1320
COAL HOLLOW	SW-2	Kanab Creek	3/31/2015	3	NonIrrig	12:00:00 AM	1680	126.00	1170.00	1170
COAL HOLLOW	SW-2	Kanab Creek	12/21/2014	12	NonIrrig	12:00:00 AM	1047	3079.00	696.00	696
COAL HOLLOW	SW-2	Kanab Creek	9/29/2014	9	Irrig	12:00:00 AM	1008	1614.00	772.00	772
COAL HOLLOW	SW-2	Kanab Creek	6/16/2014	6	Irrig	12:00:00 AM	1704	18.30	1200.00	1200
COAL HOLLOW	SW-2	Kanab Creek	3/31/2014	3	NonIrrig	12:00:00 AM	1641	97.00	1220.00	1220
COAL HOLLOW	SW-2	Kanab Creek	12/22/2013	12	NonIrrig	12:00:00 AM	1170	1520.00	784.00	784
COAL HOLLOW	SW-2	Kanab Creek	9/30/2013	9	Irrig	12:00:00 AM	1607	131.00	1200.00	1200
COAL HOLLOW	SW-2	Kanab Creek	5/31/2013	5	Irrig	12:00:00 AM	1566	31.30	1150.00	1150
COAL HOLLOW	SW-2	Kanab Creek	3/15/2013	3	NonIrrig	12:00:00 AM	863	2498.00	508.00	508
COAL HOLLOW	SW-2	Kanab Creek	12/12/2012	12	NonIrrig	12:00:00 AM	1030	1760.00	620.00	620

TEST	SITENAME	SITE	DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
COAL HOLLOW	SW-2	Kanab Creek	9/28/2012	9	Irrig	12:00:00 AM	1893	9.66	1460.00	1460
COAL HOLLOW	SW-2	Kanab Creek	6/21/2012	6	Irrig	12:00:00 AM	1658	17.30	1260.00	1260
COAL HOLLOW	SW-2	Kanab Creek	3/31/2012	3	NonIrrig	12:00:00 AM	1198	690.00	892.00	892
COAL HOLLOW	SW-2	Kanab Creek	12/21/2011	12	NonIrrig	12:00:00 AM	1158	2040.00	760.00	760
COAL HOLLOW	SW-2	Kanab Creek	9/9/2011	9	Irrig	12:00:00 AM	1802	22.10	1350.00	1350
COAL HOLLOW	SW-2	Kanab Creek	6/1/2011	6	Irrig	12:00:00 AM	1362	1075.00	992.00	992
COAL HOLLOW	SW-2	Kanab Creek	3/26/2011	3	NonIrrig	12:00:00 AM	1246	4414.00	981.00	981
COAL HOLLOW	SW-2	Kanab Creek	12/7/2010	12	NonIrrig	12:00:00 AM	1640	2299.00	1341.00	1341
COAL HOLLOW	SW-2	Kanab Creek	9/27/2010	9	Irrig	12:00:00 AM	2180	3.77	1712.00	1712
COAL HOLLOW	SW-2	Kanab Creek	5/13/2010	5	Irrig	12:00:00 AM	1851	293.00	1541.00	1541
COAL HOLLOW	SW-2	Kanab Creek	11/16/2009	11	Irrig	12:00:00 AM	2400	15.90	2058.00	2058
COAL HOLLOW	SW-2	Kanab Creek	5/25/2009	5	Irrig	12:00:00 AM	1952	104.00	1659.00	1659
COAL HOLLOW	SW-2	Kanab Creek	3/19/2009	3	NonIrrig	12:00:00 AM	1113	1751.00	804.00	804
COAL HOLLOW	SW-2	Kanab Creek	8/21/2008	8	Irrig	12:00:00 AM	2030	8.17	1771.00	1771
COAL HOLLOW	SW-2	Kanab Creek	6/18/2008	6	Irrig	12:00:00 AM	1921	68.00	1672.00	1672
COAL HOLLOW	SW-2	Kanab Creek	9/29/2007	9	Irrig	12:00:00 AM	1622	36.20	1434.00	1434
COAL HOLLOW	SW-2	Kanab Creek	6/22/2007	6	Irrig	12:00:00 AM	1819	3.40	1522.00	1522
COAL HOLLOW	SW-2	Kanab Creek	3/29/2007	3	NonIrrig	12:00:00 AM	1847	21.30	1511.00	1511
COAL HOLLOW	SW-2	Kanab Creek	9/7/2006	9	Irrig	12:00:00 AM	1959	5.38	1725.00	1725
COAL HOLLOW	SW-2	Kanab Creek	5/30/2006	5	Irrig	12:00:00 AM	1855	51.00	1156.00	1156
COAL HOLLOW	SW-2	Kanab Creek	11/3/2005	11	Irrig	12:00:00 AM	1814	430.00	1513.00	1513
COAL HOLLOW	SW-2	Kanab Creek	9/25/2005	9	Irrig	12:00:00 AM	1926	32.00	#N/A	1447
COAL HOLLOW	SW-2	Kanab Creek	9/25/2005	9	Irrig	12:00:00 AM	1926	32.00	1625.00	1625
COAL HOLLOW	SW-2	Kanab Creek	5/27/2005	5	Irrig	12:00:00 AM	1120	934.00	853.00	853
COAL HOLLOW	SW-2	Kanab Creek	3/17/1988	3	NonIrrig	12:00:00 AM	3590	3590.00	#N/A	2697
COAL HOLLOW	SW-2	Kanab Creek	2/11/1988	2	NonIrrig	12:00:00 AM	1270	6283.00	#N/A	954
COAL HOLLOW	SW-2	Kanab Creek	1/13/1988	1	NonIrrig	12:00:00 AM	1500	1975.00	#N/A	1127
COAL HOLLOW	SW-2	Kanab Creek	12/16/1987	12	NonIrrig	12:00:00 AM	1030	99.00	#N/A	774
COAL HOLLOW	SW-2	Kanab Creek	10/29/1987	10	Irrig	12:00:00 AM	1910	139.00	#N/A	1435
COAL HOLLOW	SW-2	Kanab Creek	8/10/1987	8	Irrig	12:00:00 AM	2440	45.00	1891.00	1891
COAL HOLLOW	SW-2	Kanab Creek	7/7/1987	7	Irrig	12:00:00 AM	2490	36.00	#N/A	1870
COAL HOLLOW	SW-2	Kanab Creek	5/27/1987	5	Irrig	12:00:00 AM	1950	54.00	#N/A	1465
COAL HOLLOW	SW-3	Kanab Creek	12/30/2017	12	NonIrrig	12:00:00 AM	1506	437.00	1120.00	1120
COAL HOLLOW	SW-3	Kanab Creek	3/29/2017	3	NonIrrig	12:00:00 AM	1319	751.00	980.00	980
COAL HOLLOW	SW-3	Kanab Creek	12/20/2016	12	NonIrrig	12:00:00 AM	767	2283.00	476.00	476
COAL HOLLOW	SW-3	Kanab Creek	3/11/2016	3	NonIrrig	12:00:00 AM	753	2413.00	424.00	424
COAL HOLLOW	SW-3	Kanab Creek	12/8/2015	12	NonIrrig	12:00:00 AM	1141	424.00	764.00	764
COAL HOLLOW	SW-3	Kanab Creek	8/23/2015	8	Irrig	12:00:00 AM	1567	41.00	1080.00	1080
COAL HOLLOW	SW-3	Kanab Creek	6/28/2015	6	Irrig	12:00:00 AM	1468	37.00	1060.00	1060
COAL HOLLOW	SW-3	Kanab Creek	3/31/2015	3	NonIrrig	12:00:00 AM	1140	522.00	748.00	748
COAL HOLLOW	SW-3	Kanab Creek	12/21/2014	12	NonIrrig	12:00:00 AM	717	2931.00	424.00	424
COAL HOLLOW	SW-3	Kanab Creek	9/29/2014	9	Irrig	12:00:00 AM	785	1560.00	532.00	532
COAL HOLLOW	SW-3	Kanab Creek	6/16/2014	6	Irrig	12:00:00 AM	1610	24.80	1170.00	1170
COAL HOLLOW	SW-3	Kanab Creek	3/31/2014	3	NonIrrig	12:00:00 AM	1520	1568.00	1030.00	1030

TEST	SITENAME	SITE	DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
COAL HOLLOW	SW-3	Kanab Creek	12/22/2013	12	NonIrrig	12:00:00 AM	899	817.00	520.00	520
COAL HOLLOW	SW-3	Kanab Creek	9/30/2013	9	Irrig	12:00:00 AM	1339	102.00	992.00	992
COAL HOLLOW	SW-3	Kanab Creek	5/31/2013	5	Irrig	12:00:00 AM	1179	188.00	828.00	828
COAL HOLLOW	SW-3	Kanab Creek	3/14/2013	3	NonIrrig	12:00:00 AM	733	3086.00	436.00	436
COAL HOLLOW	SW-3	Kanab Creek	12/12/2012	12	NonIrrig	12:00:00 AM	701	1495.00	388.00	388
COAL HOLLOW	SW-3	Kanab Creek	11/29/2012	11	Irrig	12:00:00 AM	701	1498.00	452.00	452
COAL HOLLOW	SW-3	Kanab Creek	9/28/2012	9	Irrig	12:00:00 AM	1464	141.00	1040.00	1040
COAL HOLLOW	SW-3	Kanab Creek	6/21/2012	6	Irrig	12:00:00 AM	1687	14.90	1310.00	1310
COAL HOLLOW	SW-3	Kanab Creek	4/24/2012	4	Irrig	12:00:00 AM	860	336.00	548.00	548
COAL HOLLOW	SW-3	Kanab Creek	3/31/2012	3	NonIrrig	12:00:00 AM	1158	488.00	836.00	836
COAL HOLLOW	SW-3	Kanab Creek	12/21/2011	12	NonIrrig	12:00:00 AM	969	1191.00	608.00	608
COAL HOLLOW	SW-3	Kanab Creek	9/10/2011	9	Irrig	12:00:00 AM	1390	266.00	1080.00	1080
COAL HOLLOW	SW-3	Kanab Creek	6/1/2011	6	Irrig	12:00:00 AM	1002	1449.00	680.00	680
COAL HOLLOW	SW-3	Kanab Creek	3/26/2011	3	NonIrrig	12:00:00 AM	871	4544.00	590.00	590
COAL HOLLOW	SW-3	Kanab Creek	12/7/2010	12	NonIrrig	12:00:00 AM	724	3051.00	438.00	438
COAL HOLLOW	SW-3	Kanab Creek	9/27/2010	9	Irrig	12:00:00 AM	1544	34.90	1201.00	1201
COAL HOLLOW	SW-3	Kanab Creek	5/13/2010	5	Irrig	12:00:00 AM	1096	587.00	799.00	799
COAL HOLLOW	SW-3	Kanab Creek	11/16/2009	11	Irrig	12:00:00 AM	1252	201.00	974.00	974
COAL HOLLOW	SW-3	Kanab Creek	9/29/2009	9	Irrig	12:00:00 AM	1618	28.80	1326.00	1326
COAL HOLLOW	SW-3	Kanab Creek	5/25/2009	5	Irrig	12:00:00 AM	1556	195.00	1239.00	1239
COAL HOLLOW	SW-3	Kanab Creek	3/19/2009	3	NonIrrig	12:00:00 AM	934	1267.00	612.00	612
COAL HOLLOW	SW-3	Kanab Creek	8/21/2008	8	Irrig	12:00:00 AM	1636	37.10	1358.00	1358
COAL HOLLOW	SW-3	Kanab Creek	6/18/2008	6	Irrig	12:00:00 AM	1679	68.90	1312.00	1312
COAL HOLLOW	SW-3	Kanab Creek	3/22/2008	3	NonIrrig	12:00:00 AM	592	4170.00	418.00	418
COAL HOLLOW	SW-3	Kanab Creek	12/30/2007	12	NonIrrig	12:00:00 AM	572	1970.00	521.00	521
COAL HOLLOW	SW-3	Kanab Creek	9/29/2007	9	Irrig	12:00:00 AM	1422	85.00	1206.00	1206
COAL HOLLOW	SW-3	Kanab Creek	6/22/2007	6	Irrig	12:00:00 AM	1662	36.70	1372.00	1372
COAL HOLLOW	SW-3	Kanab Creek	3/29/2007	3	NonIrrig	12:00:00 AM	1503	191.00	1167.00	1167
COAL HOLLOW	SW-3	Kanab Creek	12/21/2006	12	NonIrrig	12:00:00 AM	819	409.00	570.00	570
COAL HOLLOW	SW-3	Kanab Creek	9/7/2006	9	Irrig	12:00:00 AM	1465	109.00	1257.00	1257
COAL HOLLOW	SW-3	Kanab Creek	5/30/2006	5	Irrig	12:00:00 AM	1563	166.00	1255.00	1255
COAL HOLLOW	SW-3	Kanab Creek	3/31/2006	3	NonIrrig	12:00:00 AM	878	2692.00	554.00	554
COAL HOLLOW	SW-3	Kanab Creek	11/3/2005	11	Irrig	12:00:00 AM	1519	320.00	1144.00	1144
COAL HOLLOW	SW-3	Kanab Creek	9/25/2005	9	Irrig	12:00:00 AM	1665	119.00	#N/A	1251
COAL HOLLOW	SW-3	Kanab Creek	9/25/2005	9	Irrig	12:00:00 AM	1665	119.00	1281.00	1281
COAL HOLLOW	SW-3	Kanab Creek	5/27/2005	5	Irrig	12:00:00 AM	874	1850.00	644.00	644
COAL HOLLOW	SW-3	Kanab Creek	3/17/1988	3	NonIrrig	12:00:00 AM	795	3590.00	#N/A	597
COAL HOLLOW	SW-3	Kanab Creek	2/20/1988	2	NonIrrig	12:00:00 AM	780	3366.00	574.86	574.86
COAL HOLLOW	SW-3	Kanab Creek	1/9/1988	1	NonIrrig	12:00:00 AM	800	449.00	589.60	589.6
COAL HOLLOW	SW-3	Kanab Creek	12/16/1987	12	NonIrrig	12:00:00 AM	860	54.00	#N/A	646
COAL HOLLOW	SW-3	Kanab Creek	11/13/1987	11	Irrig	12:00:00 AM	1525	350.00	#N/A	1146
COAL HOLLOW	SW-3	Kanab Creek	10/26/1987	10	Irrig	12:00:00 AM	1350	233.00	#N/A	1014
COAL HOLLOW	SW-3	Kanab Creek	9/4/1987	9	Irrig	12:00:00 AM	1450	126.00	#N/A	1089
COAL HOLLOW	SW-3	Kanab Creek	8/3/1987	8	Irrig	12:00:00 AM	1110	184.00	#N/A	834

TEST	SITENAME	SITE	DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
COAL HOLLOW	SW-3	Kanab Creek	7/1/1987	7	Irrig	12:00:00 AM	1210	206.00	#N/A	909
COAL HOLLOW	SW-4	Robinson Creek	12/29/2017	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	9/21/2017	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	3/29/2017	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	12/20/2016	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	9/9/2016	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	6/5/2016	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	3/23/2016	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	12/9/2015	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	8/22/2015	8	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	6/29/2015	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	3/29/2015	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	12/20/2014	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	9/29/2014	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	6/16/2014	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	3/30/2014	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	12/19/2013	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	9/29/2013	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	6/2/2013	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	3/14/2013	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	12/13/2012	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	9/29/2012	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	6/22/2012	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	3/30/2012	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	9/8/2011	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	6/2/2011	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	3/27/2011	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	12/23/2010	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	12/8/2010	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	9/27/2010	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	5/13/2010	5	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	5/6/2010	5	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	4/22/2010	4	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	11/17/2009	11	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	9/29/2009	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	5/25/2009	5	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	3/19/2009	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	12/30/2008	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	8/20/2008	8	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	6/18/2008	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	3/22/2008	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	11/29/2007	11	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	9/27/2007	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	6/21/2007	6	Irrig	12:00:00 AM		0.00		

TEST	SITENAME	SITE	DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
COAL HOLLOW	SW-4	Robinson Creek	3/28/2007	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	12/21/2006	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	9/8/2006	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	5/16/2006	5	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	11/4/2005	11	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	9/25/2005	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	5/27/2005	5	Irrig	12:00:00 AM	453	539.00	283.00	283
COAL HOLLOW	SW-4	Robinson Creek	3/18/1988	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	2/16/1988	2	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	1/5/1988	1	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	12/4/1987	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	11/15/1987	11	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	10/27/1987	10	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	9/6/1987	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	8/4/1987	8	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-4	Robinson Creek	7/2/1987	7	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	12/30/2017	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	9/19/2017	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	5/9/2017	5	Irrig	12:00:00 AM	1755	49.00	1300.00	1300
COAL HOLLOW	SW-5	Robinson Creek	3/29/2017	3	NonIrrig	12:00:00 AM	1689	93.00	1250.00	1250
COAL HOLLOW	SW-5	Robinson Creek	12/20/2016	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	9/8/2016	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	6/4/2016	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	3/11/2016	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	12/8/2015	12	NonIrrig	12:00:00 AM	1511	17.00	996.00	996
COAL HOLLOW	SW-5	Robinson Creek	8/23/2015	8	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	6/28/2015	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	3/30/2015	3	NonIrrig	12:00:00 AM	1969	4.81	1510.00	1510
COAL HOLLOW	SW-5	Robinson Creek	12/21/2014	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	9/29/2014	9	Irrig	12:00:00 AM	1365	8.10	1020.00	1020
COAL HOLLOW	SW-5	Robinson Creek	6/15/2014	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	3/31/2014	3	NonIrrig	12:00:00 AM	1852	3.83	1280.00	1280
COAL HOLLOW	SW-5	Robinson Creek	12/22/2013	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	9/30/2013	9	Irrig	12:00:00 AM	1901	0.24	1430.00	1430
COAL HOLLOW	SW-5	Robinson Creek	5/31/2013	5	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	3/14/2013	3	NonIrrig	12:00:00 AM	1404	0.31	928.00	928
COAL HOLLOW	SW-5	Robinson Creek	12/12/2012	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	9/28/2012	9	Irrig	12:00:00 AM	1842	1.01	1310.00	1310
COAL HOLLOW	SW-5	Robinson Creek	5/20/2012	5	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	3/31/2012	3	NonIrrig	12:00:00 AM	1593	0.16	1250.00	1250
COAL HOLLOW	SW-5	Robinson Creek	12/21/2011	12	NonIrrig	12:00:00 AM	2170	0.00	1680.00	1680
COAL HOLLOW	SW-5	Robinson Creek	9/8/2011	9	Irrig	12:00:00 AM	1702	0.94	1380.00	1380
COAL HOLLOW	SW-5	Robinson Creek	6/1/2011	6	Irrig	12:00:00 AM	1750	26.80	1280.00	1280
COAL HOLLOW	SW-5	Robinson Creek	6/1/2011	6	Irrig	12:00:00 AM	1522	148.00	#N/A	

TEST	SITENAME	SITE	DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
COAL HOLLOW	SW-5	Robinson Creek	3/26/2011	3	NonIrrig	12:00:00 AM	1463	145.00	1201.00	1201
COAL HOLLOW	SW-5	Robinson Creek	12/7/2010	12	NonIrrig	12:00:00 AM	1424	0.21	1016.00	1016
COAL HOLLOW	SW-5	Robinson Creek	9/27/2010	9	Irrig	12:00:00 AM	1610	0.06	1091.00	1091
COAL HOLLOW	SW-5	Robinson Creek	5/13/2010	5	Irrig	12:00:00 AM	1382	30.00	1041.00	1041
COAL HOLLOW	SW-5	Robinson Creek	5/6/2010	5	Irrig	12:00:00 AM	1423	34.10	1046.00	1046
COAL HOLLOW	SW-5	Robinson Creek	11/16/2009	11	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	9/29/2009	9	Irrig	12:00:00 AM	1483	1.05	1055.00	1055
COAL HOLLOW	SW-5	Robinson Creek	5/25/2009	5	Irrig	12:00:00 AM	1528	24.50	1101.00	1101
COAL HOLLOW	SW-5	Robinson Creek	3/19/2009	3	NonIrrig	12:00:00 AM	1547	16.90	1186.00	1186
COAL HOLLOW	SW-5	Robinson Creek	12/30/2008	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	8/21/2008	8	Irrig	12:00:00 AM	1484	4.52	1122.00	1122
COAL HOLLOW	SW-5	Robinson Creek	6/18/2008	6	Irrig	12:00:00 AM	1620	4.98	1255.00	1255
COAL HOLLOW	SW-5	Robinson Creek	3/22/2008	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	12/29/2007	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	9/29/2007	9	Irrig	12:00:00 AM	960	0.23	751.00	751
COAL HOLLOW	SW-5	Robinson Creek	6/22/2007	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	3/29/2007	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	12/30/2006	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	9/7/2006	9	Irrig	12:00:00 AM	1394	4.96	1081.00	1081
COAL HOLLOW	SW-5	Robinson Creek	5/30/2006	5	Irrig	12:00:00 AM	1543	5.37	1205.00	1205
COAL HOLLOW	SW-5	Robinson Creek	3/31/2006	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	5/27/2005	5	Irrig	12:00:00 AM	721	410.00	469.00	469
COAL HOLLOW	SW-5	Robinson Creek	3/17/1988	3	NonIrrig	12:00:00 AM	1670	4.50		
COAL HOLLOW	SW-5	Robinson Creek	2/11/1988	2	NonIrrig	12:00:00 AM	665	36.00		
COAL HOLLOW	SW-5	Robinson Creek	11/18/1987	11	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-5	Robinson Creek	11/18/1987	11	Irrig		1305	0.05		
COAL HOLLOW	SW-5	Robinson Creek	10/29/1987	10	Irrig	12:00:00 AM	1070	58.00		
COAL HOLLOW	SW-5	Robinson Creek	9/14/1987	9	Irrig	12:00:00 AM	1480	13.50		
COAL HOLLOW	SW-5	Robinson Creek	8/10/1987	8	Irrig	12:00:00 AM	1680	13.50		
COAL HOLLOW	SW-6	Sink Valley Wash	12/28/2017	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	9/21/2017	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	6/16/2017	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	3/30/2017	3	NonIrrig	12:00:00 AM	1374	14.90	876.00	876
COAL HOLLOW	SW-6	Sink Valley Wash	12/21/2016	12	NonIrrig	12:00:00 AM	1531	23.00	1100.00	1100
COAL HOLLOW	SW-6	Sink Valley Wash	9/9/2016	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	6/6/2016	6	Irrig	12:00:00 AM	2068	10.20	1420.00	1420
COAL HOLLOW	SW-6	Sink Valley Wash	3/18/2016	3	NonIrrig	12:00:00 AM	3527	0.73	2910.00	2910
COAL HOLLOW	SW-6	Sink Valley Wash	12/9/2015	12	NonIrrig	12:00:00 AM	3504	2.44	2830.00	2830
COAL HOLLOW	SW-6	Sink Valley Wash	8/21/2015	8	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	6/29/2015	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	3/30/2015	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	12/19/2014	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	9/28/2014	9	Irrig	12:00:00 AM	1275	6.92	852.00	852
COAL HOLLOW	SW-6	Sink Valley Wash	6/16/2014	6	Irrig	12:00:00 AM		0.00		

TEST	SITENAME	SITE	DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
COAL HOLLOW	SW-6	Sink Valley Wash	3/29/2014	3	NonIrrig	12:00:00 AM	1621	0.59	1090.00	1090
COAL HOLLOW	SW-6	Sink Valley Wash	12/20/2013	12	NonIrrig	12:00:00 AM	702	26.30	716.00	716
COAL HOLLOW	SW-6	Sink Valley Wash	9/28/2013	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	6/1/2013	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	3/12/2013	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	12/14/2012	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	9/29/2012	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	6/21/2012	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	3/29/2012	3	NonIrrig	12:00:00 AM	2780	1.28	2220.00	2220
COAL HOLLOW	SW-6	Sink Valley Wash	12/19/2011	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	9/7/2011	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	6/2/2011	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	3/28/2011	3	NonIrrig	12:00:00 AM	1386	378.00	1107.00	1107
COAL HOLLOW	SW-6	Sink Valley Wash	12/6/2010	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	5/13/2010	5	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	5/6/2010	5	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	4/23/2010	4	Irrig	12:00:00 AM	2230		1821.00	1821
COAL HOLLOW	SW-6	Sink Valley Wash	3/30/2010	3	NonIrrig	12:00:00 AM	196	118.00	127.00	127
COAL HOLLOW	SW-6	Sink Valley Wash	11/18/2009	11	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	9/30/2009	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	5/24/2009	5	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	3/19/2009	3	NonIrrig	12:00:00 AM	2430	2.29	2024.00	2024
COAL HOLLOW	SW-6	Sink Valley Wash	3/18/2009	3	NonIrrig	12:00:00 AM	1477	9.40		
COAL HOLLOW	SW-6	Sink Valley Wash	12/30/2008	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	8/20/2008	8	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	6/17/2008	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	3/22/2008	3	NonIrrig	12:00:00 AM	734	1370.00	575.00	575
COAL HOLLOW	SW-6	Sink Valley Wash	12/30/2007	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	9/30/2007	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	6/20/2007	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	3/30/2007	3	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	12/30/2006	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	9/7/2006	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	5/29/2006	5	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	5/16/2006	5	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	3/30/2006	3	NonIrrig	12:00:00 AM	1352	57.70	1028.00	1028
COAL HOLLOW	SW-6	Sink Valley Wash	11/3/2005	11	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	9/24/2005	9	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	3/11/1988	3	NonIrrig	12:00:00 AM	1600	0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	12/15/1987	12	NonIrrig	12:00:00 AM	1840	0.00		
COAL HOLLOW	SW-6	Sink Valley Wash	9/17/1987	9	Irrig	12:00:00 AM	860	0.00		
COAL HOLLOW	SW-8	Swapp Hollow	12/29/2017	12	NonIrrig	12:00:00 AM	569	15.30	360.00	360
COAL HOLLOW	SW-8	Swapp Hollow	9/21/2017	9	Irrig	12:00:00 AM	558	10.40	308.00	308
COAL HOLLOW	SW-8	Swapp Hollow	6/15/2017	6	Irrig	12:00:00 AM	576	11.30	344.00	344

TEST	SITENAME	SITE	DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
COAL HOLLOW	SW-8	Swapp Hollow	3/29/2017	3	NonIrrig	12:00:00 AM	735	24.00	480.00	480
COAL HOLLOW	SW-8	Swapp Hollow	12/20/2016	12	NonIrrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-8	Swapp Hollow	9/10/2016	9	Irrig	12:00:00 AM	587	2.55	404.00	404
COAL HOLLOW	SW-8	Swapp Hollow	6/5/2016	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-8	Swapp Hollow	3/17/2016	3	NonIrrig	12:00:00 AM	563	11.10	288.00	288
COAL HOLLOW	SW-8	Swapp Hollow	12/9/2015	12	NonIrrig	12:00:00 AM	506	18.50	276.00	276
COAL HOLLOW	SW-8	Swapp Hollow	6/29/2015	6	Irrig	12:00:00 AM		0.00		
COAL HOLLOW	SW-8	Swapp Hollow	3/29/2015	3	NonIrrig	12:00:00 AM	552	8.44	380.00	380
COAL HOLLOW	SW-8	Swapp Hollow	12/20/2014	12	NonIrrig	12:00:00 AM	632	8.38	364.00	364
COAL HOLLOW	SW-8	Swapp Hollow	9/30/2014	9	Irrig	12:00:00 AM	613	6.47	396.00	396
COAL HOLLOW	SW-8	Swapp Hollow	6/15/2014	6	Irrig	12:00:00 AM	589	2.10	332.00	332
COAL HOLLOW	SW-8	Swapp Hollow	3/29/2014	3	NonIrrig	12:00:00 AM	591	14.60	364.00	364
COAL HOLLOW	SW-8	Swapp Hollow	12/20/2013	12	NonIrrig	12:00:00 AM	602	16.90	336.00	336
COAL HOLLOW	SW-8	Swapp Hollow	9/29/2013	9	Irrig	12:00:00 AM	568	15.70	296.00	296
COAL HOLLOW	SW-8	Swapp Hollow	6/1/2013	6	Irrig	12:00:00 AM	502	13.50	256.00	256
COAL HOLLOW	SW-8	Swapp Hollow	3/15/2013	3	NonIrrig	12:00:00 AM	498	49.00	316.00	316
COAL HOLLOW	SW-8	Swapp Hollow	12/14/2012	12	NonIrrig	12:00:00 AM	592	26.10	432.00	432
COAL HOLLOW	SW-8	Swapp Hollow	9/29/2012	9	Irrig	12:00:00 AM	550	4.76	356.00	356
COAL HOLLOW	SW-8	Swapp Hollow	6/22/2012	6	Irrig	12:00:00 AM	495	13.50	238.00	238
COAL HOLLOW	SW-8	Swapp Hollow	3/29/2012	3	NonIrrig	12:00:00 AM	536	40.70	336.00	336
COAL HOLLOW	SW-8	Swapp Hollow	12/22/2011	12	NonIrrig	12:00:00 AM	619	40.10	368.00	368
COAL HOLLOW	SW-8	Swapp Hollow	9/10/2011	9	Irrig	12:00:00 AM	543	81.30	296.00	296
COAL HOLLOW	SW-8	Swapp Hollow	6/3/2011	6	Irrig	12:00:00 AM	582	115.00	326.00	326
COAL HOLLOW	SW-8	Swapp Hollow	3/27/2011	3	NonIrrig	12:00:00 AM	786	36.10	542.00	542
COAL HOLLOW	SW-8	Swapp Hollow	12/8/2010	12	NonIrrig	12:00:00 AM	554	7.33	324.00	324
COAL HOLLOW	SW-8	Swapp Hollow	9/30/2010	9	Irrig	12:00:00 AM	465	6.05	261.00	261
COAL HOLLOW	SW-8	Swapp Hollow	5/14/2010	5	Irrig	12:00:00 AM	589	26.30	377.00	377
COAL HOLLOW	SW-8	Swapp Hollow	11/18/2009	11	Irrig	12:00:00 AM	500	20.20	308.00	308
COAL HOLLOW	SW-8	Swapp Hollow	9/30/2009	9	Irrig	12:00:00 AM	518	7.41		
COAL HOLLOW	SW-8	Swapp Hollow	5/25/2009	5	Irrig	12:00:00 AM	501	16.10	287.00	287
COAL HOLLOW	SW-8	Swapp Hollow	3/19/2009	3	NonIrrig	12:00:00 AM	394	41.90	304.00	304
COAL HOLLOW	SW-8	Swapp Hollow	12/30/2008	12	NonIrrig	12:00:00 AM				
COAL HOLLOW	SW-8	Swapp Hollow	8/21/2008	8	Irrig	12:00:00 AM	507	2.05	238.00	238
COAL HOLLOW	SW-8	Swapp Hollow	6/18/2008	6	Irrig	12:00:00 AM	514	10.70	305.00	305
COAL HOLLOW	SW-8	Swapp Hollow	11/30/2007	11	Irrig	12:00:00 AM	445	12.50	377.00	377
COAL HOLLOW	SW-8	Swapp Hollow	9/29/2007	9	Irrig	12:00:00 AM	561	10.40	353.00	353
COAL HOLLOW	SW-8	Swapp Hollow	6/22/2007	6	Irrig	12:00:00 AM	566	13.80	356.00	356
COAL HOLLOW	SW-8	Swapp Hollow	3/29/2007	3	NonIrrig	12:00:00 AM	524	33.60	324.00	324
COAL HOLLOW	SW-8	Swapp Hollow	12/20/2006	12	NonIrrig	12:00:00 AM	553	32.10	337.00	337
COAL HOLLOW	SW-8	Swapp Hollow	9/7/2006	9	Irrig	12:00:00 AM	576	50.70	331.00	331
COAL HOLLOW	SW-8	Swapp Hollow	5/30/2006	5	Irrig	12:00:00 AM	586	35.00	350.00	350
COAL HOLLOW	SW-8	Swapp Hollow	11/4/2005	11	Irrig	12:00:00 AM	555	71.10	321.00	321
COAL HOLLOW	SW-8	Swapp Hollow	9/24/2005	9	Irrig	12:00:00 AM	536	69.00	298.00	298
COAL HOLLOW	SW-8	Swapp Hollow	8/12/2005	8	Irrig	12:00:00 AM	493	130.00	274.00	274

TEST	SITENAME	SITE	DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
COAL HOLLOW	SW-8	Swapp Hollow	6/18/2005	6	Irrig	12:00:00 AM	566	290.00	366.00	366
COAL HOLLOW	SW-8	Swapp Hollow	3/21/1988	3	NonIrrig	12:00:00 AM	610	49.00		
COAL HOLLOW	SW-8	Swapp Hollow	2/17/1988	2	NonIrrig	12:00:00 AM	565	49.00		
COAL HOLLOW	SW-8	Swapp Hollow	1/13/1988	1	NonIrrig	12:00:00 AM	550	40.00		
COAL HOLLOW	SW-8	Swapp Hollow	12/15/1987	12	NonIrrig	12:00:00 AM	585	13.00		
COAL HOLLOW	SW-8	Swapp Hollow	11/17/1987	11	Irrig	12:00:00 AM	525	40.00		
COAL HOLLOW	SW-8	Swapp Hollow	10/28/1987	10	Irrig	12:00:00 AM	430	36.00		
COAL HOLLOW	SW-8	Swapp Hollow	9/17/1987	9	Irrig	12:00:00 AM	480	40.00		
COAL HOLLOW	SW-8	Swapp Hollow	8/6/1987	8	Irrig	12:00:00 AM	490	22.00		
COAL HOLLOW	SW-8	Swapp Hollow	7/6/1987	7	Irrig	12:00:00 AM	490	36.00		
COAL HOLLOW	SW-9	Lower Sink Valley Wash	12/28/2017	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	9/20/2017	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	6/14/2017	6	Irrig	12:00:00 AM	2597	0.71	1780.00	1780
COAL HOLLOW	SW-9	Lower Sink Valley Wash	3/28/2017	3	NonIrrig	12:00:00 AM	1960	20.95	1480.00	1480
COAL HOLLOW	SW-9	Lower Sink Valley Wash	12/19/2016	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	9/9/2016	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	6/6/2016	6	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	3/10/2016	3	NonIrrig	12:00:00 AM	3333	0.19	2670.00	2670
COAL HOLLOW	SW-9	Lower Sink Valley Wash	12/7/2015	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	8/21/2015	8	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	6/28/2015	6	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	3/30/2015	3	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	12/19/2014	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	9/28/2014	9	Irrig	12:00:00 AM	675	21.90	548.00	548
COAL HOLLOW	SW-9	Lower Sink Valley Wash	6/15/2014	6	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	3/28/2014	3	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	12/20/2013	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	9/28/2013	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	5/31/2013	5	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	3/13/2013	3	NonIrrig	12:00:00 AM	2660	0.05	1980.00	1980
COAL HOLLOW	SW-9	Lower Sink Valley Wash	12/13/2012	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	9/29/2012	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	5/8/2012	5	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	3/29/2012	3	NonIrrig	12:00:00 AM	4470	0.05	3400.00	3400
COAL HOLLOW	SW-9	Lower Sink Valley Wash	12/19/2011	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	9/6/2011	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	5/31/2011	5	Irrig	12:00:00 AM	3560	0.17	2780.00	2780
COAL HOLLOW	SW-9	Lower Sink Valley Wash	3/26/2011	3	NonIrrig	12:00:00 AM	1495	492.00	1146.00	1146
COAL HOLLOW	SW-9	Lower Sink Valley Wash	12/7/2010	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	9/28/2010	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	5/13/2010	5	Irrig	12:00:00 AM	2390	2.91	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash	5/6/2010	5	Irrig	12:00:00 AM	2380	0.01	1882.00	1882
COAL HOLLOW	SW-9	Lower Sink Valley Wash	4/23/2010	4	Irrig	12:00:00 AM	1722	33.60	1314.00	1314
COAL HOLLOW	SW-9	Lower Sink Valley Wash	3/30/2010	3	NonIrrig	12:00:00 AM	#N/A	7.01	837.00	837

TEST	SITENAME	SITE		DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
COAL HOLLOW	SW-9	Lower Sink Valley Wash		11/18/2009	11	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		9/29/2009	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		5/24/2009	5	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		3/18/2009	3	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		12/30/2008	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		8/20/2008	8	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		7/27/2008	7	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		6/17/2008	6	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		3/22/2008	3	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		3/21/2008	3	NonIrrig	12:00:00 AM	382	182.00	360.00	360
COAL HOLLOW	SW-9	Lower Sink Valley Wash		12/29/2007	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		9/30/2007	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		6/20/2007	6	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		3/29/2007	3	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		12/20/2006	12	NonIrrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		9/8/2006	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		6/18/2006	6	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		5/29/2006	5	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		5/3/2006	5	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		3/30/2006	3	NonIrrig	12:00:00 AM	1715	10.60	1270.00	1270
COAL HOLLOW	SW-9	Lower Sink Valley Wash		11/3/2005	11	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		9/24/2005	9	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		6/17/2005	6	Irrig	12:00:00 AM	#N/A	0.00	#N/A	
COAL HOLLOW	SW-9	Lower Sink Valley Wash		3/24/1988	3	NonIrrig	12:00:00 AM	3820	1.30	#N/A	2914.264
COAL HOLLOW	SW-9	Lower Sink Valley Wash		2/16/1988	2	NonIrrig	12:00:00 AM	955	763.00	#N/A	736.291
COAL HOLLOW	SW-9	Lower Sink Valley Wash		11/17/1987	11	Irrig	12:00:00 AM	1390	18.00	#N/A	1066.978
COAL HOLLOW	SW-9	Lower Sink Valley Wash		10/29/1987	10	Irrig	12:00:00 AM	#N/A	9.00	#N/A	
Coal Hollow	KANAB CK AT FALLS XING		4951830	6/19/2006	6	Irrig	12:00:00 AM	1954	28.70	1458	1458
Coal Hollow	KANAB CK AT FALLS XING		4951830	7/31/2006	7	Irrig	12:00:00 AM	561	2244.16	372	372
Coal Hollow	KANAB CK AT FALLS XING		4951830	8/28/2006	8	Irrig	12:00:00 AM	#N/A	#N/A	1390	1390
Coal Hollow	KANAB CK AT FALLS XING		4951830	9/19/2006	9	Irrig	12:00:00 AM	1900	23.70	1396	1396
Coal Hollow	KANAB CK AT FALLS XING		4951830	10/18/2006	10	Irrig	12:00:00 AM	#N/A	#N/A	1572	1572
Coal Hollow	KANAB CK AT FALLS XING		4951830	11/24/2006	11	Irrig	12:00:00 AM	1076	2693.00	772	772
Coal Hollow	KANAB CK AT FALLS XING		4951830	12/29/2006	12	NonIrrig	12:00:00 AM	1383	1346.50	802	802
Coal Hollow	KANAB CK AT FALLS XING		4951830	1/29/2007	1	NonIrrig	12:00:00 AM	1172	2244.16	1010	1010
Coal Hollow	KANAB CK AT FALLS XING		4951830	2/26/2007	2	NonIrrig	12:00:00 AM	1047	2244.16	744	744
Coal Hollow	KANAB CK AT FALLS XING		4951830	3/26/2007	3	NonIrrig	12:00:00 AM	1919	224.42	1716	1716
Coal Hollow	KANAB CK AT FALLS XING		4951830	4/24/2007	4	Irrig	12:00:00 AM	1634	112.21	1442	1442
Coal Hollow	KANAB CK AT FALLS XING		4951830	5/28/2007	5	Irrig	12:00:00 AM	1775	89.77	1484	1484
Coal Hollow	KANAB CK AT FALLS XING		4951830	6/25/2007	6	Irrig	12:00:00 AM	2019	24.20	1566	1566
Coal Hollow	KANAB CK AT FALLS XING		4951830	7/30/2007	7	Irrig	12:00:00 AM	1307	112.21	1142	1142
Coal Hollow	KANAB CK AT FALLS XING		4951830	8/28/2007	8	Irrig	12:00:00 AM	1716	30.00	1656	1656
Coal Hollow	KANAB CK AT FALLS XING		4951830	9/28/2007	9	Irrig	12:00:00 AM	#N/A	#N/A	1394	1394
Coal Hollow	KANAB CK AT FALLS XING		4951830	10/29/2007	10	Irrig	12:00:00 AM	1466	89.77	1412	1412

TEST	SITENAME	SITE		DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
Coal Hollow	KANAB CK AT FALLS XING		4951830	11/24/2007	11	Irrig	12:00:00 AM	1681	89.77	1594	1594
Coal Hollow	KANAB CK AT FALLS XING		4951830	12/26/2007	12	NonIrrig	12:00:00 AM	2275	179.53	1808	1808
Coal Hollow	KANAB CK AT FALLS XING		4951830	1/23/2008	1	NonIrrig	12:00:00 AM	1199	897.67	794	794
Coal Hollow	KANAB CK AT FALLS XING		4951830	2/26/2008	2	NonIrrig	12:00:00 AM	1101	448.83	752	752
Coal Hollow	KANAB CK AT FALLS XING		4951830	4/28/2008	4	Irrig	12:00:00 AM	1848	20.00	1464	1464
Coal Hollow	KANAB CK AT FALLS XING		4951830	5/26/2008	5	Irrig	12:00:00 AM	1770	44.88	1542	1542
Coal Hollow	KANAB CK AT FALLS XING		4951830	6/16/2008	6	Irrig	12:00:00 AM	1868	44.88	1354	1354
Coal Hollow	KANAB CK AT FALLS XING		4951830	7/30/2008	7	Irrig	12:00:00 AM	1874	20.00	1550	1550
Coal Hollow	KANAB CK AT FALLS XING		4951830	8/25/2008	8	Irrig	12:00:00 AM	1697	20.00	1398	1398
Coal Hollow	KANAB CK AT FALLS XING		4951830	9/22/2008	9	Irrig	12:00:00 AM	2043	89.77	1542	1542
Coal Hollow	KANAB CK AT FALLS XING		4951830	10/28/2008	10	Irrig	12:00:00 AM	1674	44.88	1460	1460
Coal Hollow	KANAB CK AT FALLS XING		4951830	11/25/2008	11	Irrig	12:00:00 AM	1734	89.77	1458	1458
Coal Hollow	KANAB CK AT FALLS XING		4951830	12/31/2008	12	NonIrrig	12:00:00 AM	#N/A	0.00	1540	1540
Coal Hollow	KANAB CK AT FALLS XING		4951830	1/28/2009	1	NonIrrig	12:00:00 AM	1766	1346.50	1540	1540
Coal Hollow	KANAB CK AT FALLS XING		4951830	2/25/2009		NonIrrig	12:00:00 AM	#N/A	#N/A	1130	1130
Coal Hollow	KANAB CK AT FALLS XING		4951830	3/30/2009	3	NonIrrig	12:00:00 AM	1697	314.18	1256	1256
Coal Hollow	KANAB CK AT FALLS XING		4951830	4/23/2009	4	Irrig	12:00:00 AM	1960	44.88	1498	1498
Coal Hollow	KANAB CK AT FALLS XING		4951830	5/26/2009	5	Irrig	12:00:00 AM	2114	89.77	1376	1376
Coal Hollow	KANAB CK AT FALLS XING		4951830	6/17/2009	6	Irrig	12:00:00 AM	1895	89.77	1482	1482
Coal Hollow	KANAB CK AT FALLS XING		4951830	7/28/2009	7	Irrig	12:00:00 AM	1878	44.88	1516	1516
Coal Hollow	KANAB CK AT FALLS XING		4951830	8/25/2009	8	Irrig	12:00:00 AM	1981	4488.33	1538	1538
Coal Hollow	KANAB CK AT FALLS XING		4951830	9/29/2009	9	Irrig	12:00:00 AM	1889	44.88	1508	1508
Coal Hollow	KANAB CK AT FALLS XING		4951830	10/29/2009	10	Irrig	12:00:00 AM	1611	89.77	1276	1276
Coal Hollow	KANAB CK AT FALLS XING		4951830	11/11/2009	11	Irrig	12:00:00 AM	1770	89.77	1584	1584
Coal Hollow	KANAB CK AT FALLS XING		4951830	1/30/2010	1	NonIrrig	12:00:00 AM	1311	448.83	892	892
Coal Hollow	KANAB CK AT FALLS XING		4951830	3/24/2010	3	NonIrrig	12:00:00 AM	1173	3590.66	1192	1192
Coal Hollow	KANAB CK AT FALLS XING		4951830	4/27/2010	4	Irrig	12:00:00 AM	1512	673.25	860	860
Coal Hollow	KANAB CK AT FALLS XING		4951830	5/26/2010	5	Irrig	12:00:00 AM	1457	89.77	1128	1128
Coal Hollow	KANAB CK AT FALLS XING		4951830	6/28/2010	6	Irrig	12:00:00 AM	893	89.77	1686	1686
Coal Hollow	KANAB CK AT FALLS XING		4951830	7/28/2010	7	Irrig	12:00:00 AM	1606	89.77	1580	1580
Coal Hollow	KANAB CK AT FALLS XING		4951830	8/30/2010	8	Irrig	12:00:00 AM	#N/A	89.77	1658	1658
Coal Hollow	KANAB CK AT FALLS XING		4951830	10/28/2010	10	Irrig	12:00:00 AM	809	1122.08	1432	1432
Coal Hollow	KANAB CK AT FALLS XING		4951830	11/30/2010	11	Irrig	12:00:00 AM	1642	897.67	608	608
Coal Hollow	KANAB CK AT FALLS XING		4951830	12/31/2010	12	NonIrrig	12:00:00 AM	1735	2244.16	1534	1534
Coal Hollow	KANAB CK AT FALLS XING		4951830	1/28/2011	1	NonIrrig	12:00:00 AM	1171	1346.50	1306	1306
Coal Hollow	KANAB CK AT FALLS XING		4951830	3/2/2011	3	NonIrrig	12:00:00 AM	1120	1795.33	766	766
Coal Hollow	KANAB CK AT FALLS XING		4951830	3/28/2011	3	NonIrrig	12:00:00 AM	1073	8976.65	720	720
Coal Hollow	KANAB CK AT FALLS XING		4951830	4/30/2011	4	Irrig	12:00:00 AM	986	1122.08	720	720
Coal Hollow	KANAB CK AT FALLS XING		4951830	5/28/2011	5	Irrig	12:00:00 AM	1096	1346.50	718	718
Coal Hollow	KANAB CK AT FALLS XING		4951830	7/7/2011	7	Irrig	12:00:00 AM	1014	134.65	634	634
Coal Hollow	KANAB CK AT FALLS XING		4951830	8/1/2011	8	Irrig	12:00:00 AM	1042	134.65	740	740
Coal Hollow	KANAB CK AT FALLS XING		4951830	9/5/2011	9	Irrig	12:00:00 AM	1149	134.65	676	676
Coal Hollow	KANAB CK AT FALLS XING		4951830	9/27/2011	9	Irrig	12:00:00 AM	1256	134.65	742	742
Coal Hollow	KANAB CK AT FALLS XING		4951830	10/29/2011	10	Irrig	12:00:00 AM	1035	1346.50	798	798

TEST	SITENAME	SITE		DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
Coal Hollow	KANAB CK AT FALLS XING		4951830	11/25/2011	11	Irrig	12:00:00 AM	1106	1570.91	798	798
Coal Hollow	KANAB CK AT FALLS XING		4951830	12/28/2011	12	NonIrrig	12:00:00 AM	1071	1795.33	798	798
Coal Hollow	KANAB CK AT FALLS XING		4951830	1/30/2012	1	NonIrrig	12:00:00 AM	1286	1795.33	816	816
Coal Hollow	KANAB CK AT FALLS XING		4951830	3/7/2012	3	NonIrrig	12:00:00 AM	1555	4488.33	686	686
Coal Hollow	KANAB CK AT FALLS XING		4951830	5/10/2012	5	Irrig	12:00:00 AM	1375	89.77	884	884
Coal Hollow	KANAB CK AT FALLS XING		4951830	6/21/2012	6	Irrig	12:00:00 AM	1408	2244.16	732	732
Coal Hollow	KANAB CK AT FALLS XING		4951830	7/30/2012	7	Irrig	12:00:00 AM	2904	89.77	874	874
Coal Hollow	KANAB CK AT FALLS XING		4951830	8/28/2012	8	Irrig	12:00:00 AM	782	134.65	960	960
Coal Hollow	KANAB CK AT FALLS XING		4951830	9/25/2012	9	Irrig	12:00:00 AM	1713	89.77	1424	1424
Coal Hollow	KANAB CK AT FALLS XING		4951830	10/29/2012	10	Irrig	12:00:00 AM	1259	673.25	1022	1022
Coal Hollow	KANAB CK AT FALLS XING		4951830	11/27/2012	11	Irrig	12:00:00 AM	1192	1570.91	2536	2536
Coal Hollow	KANAB CK AT FALLS XING		4951830	1/28/2013	1	NonIrrig	12:00:00 AM	1356	179.53	1324	1324
Coal Hollow	KANAB CK AT FALLS XING		4951830	2/25/2013	2	NonIrrig	12:00:00 AM	1080	897.67	1440	1440
Coal Hollow	KANAB CK AT FALLS XING		4951830	3/23/2013	3	NonIrrig	12:00:00 AM	1022	1346.50	926	926
Coal Hollow	KANAB CK AT FALLS XING		4951830	4/22/2013	4	Irrig	12:00:00 AM	1574	224.42	724	724
Coal Hollow	KANAB CK AT FALLS XING		4951830	5/27/2013	5	Irrig	12:00:00 AM	1713	89.77	998	998
Coal Hollow	KANAB CK AT FALLS XING		4951830	6/28/2013	6	Irrig	12:00:00 AM	1137	44.88	842	842
Coal Hollow	KANAB CK AT FALLS XING		4951830	7/29/2013	7	Irrig	12:00:00 AM	594	1795.33	642	642
Coal Hollow	KANAB CK AT FALLS XING		4951830	8/29/2013	8	Irrig	12:00:00 AM	248	179.53	1314	1314
Coal Hollow	KANAB CK AT FALLS XING		4951830	9/23/2013	9	Irrig	12:00:00 AM	1723	1122.08	398	398
Coal Hollow	KANAB CK AT FALLS XING		4951830	10/30/2013	10	Irrig	12:00:00 AM	1749	897.67	1384	1384
Coal Hollow	KANAB CK AT FALLS XING		4951830	11/18/2013	11	Irrig	12:00:00 AM	401	224.42	1112	1112
Coal Hollow	KANAB CK AT FALLS XING		4951830	1/1/2014	1	NonIrrig	12:00:00 AM	332	2693.00	658	658
Coal Hollow	KANAB CK AT FALLS XING		4951830	1/29/2014	1	NonIrrig	12:00:00 AM	1002	1570.91	534	534
Coal Hollow	KANAB CK AT FALLS XING		4951830	2/26/2014	2	NonIrrig	12:00:00 AM	926	3590.66	626	626
Coal Hollow	KANAB CK AT FALLS XING		4951830	3/26/2014	3	NonIrrig	12:00:00 AM	1857	89.77	1504	1504
Coal Hollow	KANAB CK AT FALLS XING		4951830	4/30/2014	4	Irrig	12:00:00 AM	1820	44.88	1394	1394
Coal Hollow	KANAB CK AT FALLS XING		4951830	5/28/2014	5	Irrig	12:00:00 AM	1458	44.88	1042	1042
Coal Hollow	KANAB CK AT FALLS XING		4951830	7/28/2014	7	Irrig	12:00:00 AM	1344	44.88	1032	1032
Coal Hollow	KANAB CK AT FALLS XING		4951830	8/25/2014	8	Irrig	12:00:00 AM	1053	44.88	732	732
Coal Hollow	KANAB CK AT FALLS XING		4951830	10/28/2014	10	Irrig	12:00:00 AM	1531	1.00	1148	1148
Coal Hollow	KANAB CK AT FALLS XING		4951830	11/28/2014	11	Irrig	12:00:00 AM	1502	44.88	1080	1080
Coal Hollow	KANAB CK AT FALLS XING		4951830	1/6/2015	1	NonIrrig	12:00:00 AM	906	2244.16	558	558
Coal Hollow	KANAB CK AT FALLS XING		4951830	2/9/2015	2	NonIrrig	12:00:00 AM	1025	448.83	652	652
Coal Hollow	KANAB CK AT FALLS XING		4951830	3/10/2015	3	NonIrrig	12:00:00 AM	1457	3590.66	1076	1076
Coal Hollow	KANAB CK AT FALLS XING		4951830	4/29/2015	4	Irrig	12:00:00 AM	2036	44.88	1564	1564
Coal Hollow	KANAB CK AT FALLS XING		4951830	6/8/2015	6	Irrig	12:00:00 AM	1181	134.65	826	826
Coal Hollow	KANAB CK AT FALLS XING		4951830	7/28/2015	7	Irrig	12:00:00 AM	1271	44.88	952	952
Coal Hollow	KANAB CK AT FALLS XING		4951830	8/24/2015	8	Irrig	12:00:00 AM	1174	44.88	888	888
Coal Hollow	KANAB CK AT FALLS XING		4951830	11/27/2015	11	Irrig	12:00:00 AM	1839	1346.50	1382	1382
Coal Hollow	KANAB CK AT FALLS XING		4951830	1/19/2016	1	NonIrrig	12:00:00 AM	1146	448.83	764	764
Coal Hollow	KANAB CK AT FALLS XING		4951830	2/23/2016	2	NonIrrig	12:00:00 AM	1112	1570.91	786	786
Coal Hollow	KANAB CK AT FALLS XING		4951830	3/29/2016	3	NonIrrig	12:00:00 AM	1190	1346.50	792	792
Coal Hollow	KANAB CK AT FALLS XING		4951830	4/25/2016	4	Irrig	12:00:00 AM	2121	89.77	1654	1654

TEST	SITENAME	SITE		DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
Coal Hollow	KANAB CK AT FALLS XING		4951830	5/28/2016	5	Irrig	12:00:00 AM	1990	134.65	1562	1562
Coal Hollow	KANAB CK AT FALLS XING		4951830	7/27/2016	7	Irrig	12:00:00 AM	#N/A	0.00	1410	1410
Coal Hollow	KANAB CK AT FALLS XING		4951830	8/29/2016	8	Irrig	12:00:00 AM	581	44.88	434	434
Coal Hollow	KANAB CK AT FALLS XING		4951830	9/26/2016	9	Irrig	12:00:00 AM	1352	134.65	986	986
Coal Hollow	KANAB CK AT US89 XING		4951810	6/19/2006	6	Irrig	12:00:00 PM	537	2692.995	300	300
Coal Hollow	KANAB CK AT US89 XING		4951810	7/26/2006	7	Irrig	10:15:00 AM	445	6	304	304
Coal Hollow	KANAB CK AT US89 XING		4951810	8/27/2006	8	Irrig	10:15:00 AM	#N/A	#N/A	284	284
Coal Hollow	KANAB CK AT US89 XING		4951810	9/19/2006	9	Irrig	2:40:00 PM	507	4488.326	282	282
Coal Hollow	KANAB CK AT US89 XING		4951810	10/22/2006		Irrig	2:40:00 PM	#N/A	#N/A	326	326
Coal Hollow	KANAB CK AT US89 XING		4951810	11/22/2006	11	Irrig	3:40:00 PM	571	6956.905	378	378
Coal Hollow	KANAB CK AT US89 XING		4951810	12/19/2006	12	NonIrrig	3:40:00 PM	#N/A	#N/A	360	360
Coal Hollow	KANAB CK AT US89 XING		4951810	1/30/2007	1	NonIrrig	12:00:00 PM	533	4398.559	398	398
Coal Hollow	KANAB CK AT US89 XING		4951810	2/26/2007	2	NonIrrig	12:00:00 PM	488	3141.828	306	306
Coal Hollow	KANAB CK AT US89 XING		4951810	3/27/2007	3	NonIrrig	12:00:00 PM	460	3500.894	276	276
Coal Hollow	KANAB CK AT US89 XING		4951810	4/24/2007	4	Irrig	12:00:00 PM	487	3994.61	312	312
Coal Hollow	KANAB CK AT US89 XING		4951810	5/30/2007	5	Irrig	2:05:00 PM	464	3545.777	284	284
Coal Hollow	KANAB CK AT US89 XING		4951810	6/25/2007	6	Irrig	5:30:00 PM	484	2244.163	264	264
Coal Hollow	KANAB CK AT US89 XING		4951810	7/31/2007	7	Irrig	12:15:00 PM	317	2692.995	302	302
Coal Hollow	KANAB CK AT US89 XING		4951810	8/29/2007	8	Irrig	4:15:00 PM	423	4488.326	304	304
Coal Hollow	KANAB CK AT US89 XING		4951810	9/29/2007	9	irrig	4:15:00 PM	#N/A	#N/A	314	314
Coal Hollow	KANAB CK AT US89 XING		4951810	10/31/2007	10	Irrig	5:40:00 PM	388	3590.661	302	302
Coal Hollow	KANAB CK AT US89 XING		4951810	11/24/2007	11	Irrig	1:30:00 PM	407	4488.326	284	284
Coal Hollow	KANAB CK AT US89 XING		4951810	12/27/2007	12	NonIrrig	4:45:00 PM	539	4488.326	292	292
Coal Hollow	KANAB CK AT US89 XING		4951810	1/26/2008	1	NonIrrig	3:30:00 PM	536	4488.326	312	312
Coal Hollow	KANAB CK AT US89 XING		4951810	2/25/2008	2	NonIrrig	1:45:00 PM	587	4488.326	340	340
Coal Hollow	KANAB CK AT US89 XING		4951810	3/31/2008	3	NonIrrig	8:20:00 AM	817	4438.954		
Coal Hollow	KANAB CK AT US89 XING		4951810	4/28/2008	4	Irrig	3:00:00 PM	481	4488.326	296	296
Coal Hollow	KANAB CK AT US89 XING		4951810	5/28/2008	5	Irrig	4:00:00 PM	416	4219.026	292	292
Coal Hollow	KANAB CK AT US89 XING		4951810	6/17/2008	6	Irrig	4:29:00 PM	444	4174.143	290	290
Coal Hollow	KANAB CK AT US89 XING		4951810	7/29/2008	7	Irrig	7:45:00 AM	396	3141.828	304	304
Coal Hollow	KANAB CK AT US89 XING		4951810	8/27/2008	8	Irrig	3:05:00 PM	419	4174.143	288	288
Coal Hollow	KANAB CK AT US89 XING		4951810	9/24/2008	9	Irrig	5:50:00 PM	506	4219.026	296	296
Coal Hollow	KANAB CK AT US89 XING		4951810	10/29/2008	10	Irrig	6:25:00 PM	468	3366.244	298	298
Coal Hollow	KANAB CK AT US89 XING		4951810	11/26/2008	11	Irrig	1:00:00 PM	474	1795.33	320	320
Coal Hollow	KANAB CK AT US89 XING		4951810	12/30/2008	12	NonIrrig	5:00:00 PM	443	2603.229	298	298
Coal Hollow	KANAB CK AT US89 XING		4951810	1/30/2009	1	NonIrrig	5:00:00 PM	452	#N/A	302	302
Coal Hollow	KANAB CK AT US89 XING		4951810	2/24/2009	2	NonIrrig	5:00:00 PM	#N/A	#N/A	454	454
Coal Hollow	KANAB CK AT US89 XING		4951810	4/27/2009	4	Irrig	4:55:00 PM	488	2244.163	290	290
Coal Hollow	KANAB CK AT US89 XING		4951810	5/28/2009	5	Irrig	7:15:00 PM	509	2244.163	256	256
Coal Hollow	KANAB CK AT US89 XING		4951810	7/30/2009	7	Irrig	1:35:00 PM	541	2244.163	326	326
Coal Hollow	KANAB CK AT US89 XING		4951810	8/26/2009	8	Irrig	1:00:00 PM	504	2244.163	290	290
Coal Hollow	KANAB CK AT US89 XING		4951810	9/29/2009	9	Irrig	2:30:00 PM	484	2244.163	282	282
Coal Hollow	KANAB CK AT US89 XING		4951810	10/31/2009	10	Irrig	6:00:00 PM	491	4488.326	266	266
Coal Hollow	KANAB CK AT US89 XING		4951810	11/12/2009	11	Irrig	11:00:00 AM	444	3590.661	302	302

TEST	SITENAME	SITE		DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
Coal Hollow	KANAB CK AT US89 XING		4951810	12/31/2009	12	NonIrrig	1:05:00 PM	523	3590.661	318	318
Coal Hollow	KANAB CK AT US89 XING		4951810	1/26/2010	1	NonIrrig	1:15:00 PM	524	4039.493	296	296
Coal Hollow	KANAB CK AT US89 XING		4951810	3/24/2010	3	NonIrrig	12:00:00 PM	937	4488.326	308	308
Coal Hollow	KANAB CK AT US89 XING		4951810	4/27/2010	4	Irrig	3:46:00 PM	523	3815.077	618	618
Coal Hollow	KANAB CK AT US89 XING		4951810	5/26/2010	5	Irrig	4:30:00 PM	341	2917.412	318	318
Coal Hollow	KANAB CK AT US89 XING		4951810	6/29/2010	6	Irrig	11:20:00 AM	442	2468.579	302	302
Coal Hollow	KANAB CK AT US89 XING		4951810	7/29/2010	7	Irrig	2:30:00 PM	440	2692.995	316	316
Coal Hollow	KANAB CK AT US89 XING		4951810	10/29/2010	10	Irrig	3:35:00 PM	492	5385.991	356	356
Coal Hollow	KANAB CK AT US89 XING		4951810	11/29/2010	11	Irrig	4:15:00 PM	440	2244.163	344	344
Coal Hollow	KANAB CK AT US89 XING		4951810	12/27/2010	12	NonIrrig	1:30:00 PM	8.6	3590.661	318	318
Coal Hollow	KANAB CK AT US89 XING		4951810	1/2/2011	1	NonIrrig	3:30:00 PM	574	4488.326	466	466
Coal Hollow	KANAB CK AT US89 XING		4951810	1/29/2011	1	NonIrrig	4:40:00 PM	589	4488.326	360	360
Coal Hollow	KANAB CK AT US89 XING		4951810	3/3/2011	3	NonIrrig	11:30:00 AM	840	3590.661	536	536
Coal Hollow	KANAB CK AT US89 XING		4951810	3/29/2011	3	NonIrrig	4:19:00 PM	667	8976.651	378	378
Coal Hollow	KANAB CK AT US89 XING		4951810	4/29/2011	4	Irrig	5:30:00 PM	712	4488.326	466	466
Coal Hollow	KANAB CK AT US89 XING		4951810	5/30/2011	5	Irrig	6:15:00 PM	694	3590.661	430	430
Coal Hollow	KANAB CK AT US89 XING		4951810	7/8/2011	7	Irrig	5:04:00 PM	497	1795.33	268	268
Coal Hollow	KANAB CK AT US89 XING		4951810	8/1/2011	8	Irrig	6:45:00 PM	492	3590.661	272	272
Coal Hollow	KANAB CK AT US89 XING		4951810	9/2/2011	9	Irrig	10:30:00 AM	499	2244.163	316	316
Coal Hollow	KANAB CK AT US89 XING		4951810	9/27/2011	9	Irrig	1:45:00 PM	540	3590.661	316	316
Coal Hollow	KANAB CK AT US89 XING		4951810	10/29/2011	10	Irrig	4:30:00 PM	500	3590.661	316	316
Coal Hollow	KANAB CK AT US89 XING		4951810	11/25/2011	11	Irrig	2:45:00 PM	514	3590.661	310	310
Coal Hollow	KANAB CK AT US89 XING		4951810	1/31/2012	1	NonIrrig	6:00:00 PM	558	3590.661	316	316
Coal Hollow	KANAB CK AT US89 XING		4951810	3/7/2012	3	NonIrrig	3:55:00 PM	931	4488.326	280	280
Coal Hollow	KANAB CK AT US89 XING		4951810	5/10/2012	5	Irrig	2:20:00 PM	512	3590.661	328	328
Coal Hollow	KANAB CK AT US89 XING		4951810	6/19/2012	6	Irrig	10:45:00 AM	495	2244.163	342	342
Coal Hollow	KANAB CK AT US89 XING		4951810	7/30/2012	7	Irrig	3:00:00 PM	496	3590.661	520	520
Coal Hollow	KANAB CK AT US89 XING		4951810	9/26/2012	9	Irrig	3:30:00 PM	475	3590.661	312	312
Coal Hollow	KANAB CK AT US89 XING		4951810	10/30/2012	10	Irrig	3:15:00 PM	510	3590.661	294	294
Coal Hollow	KANAB CK AT US89 XING		4951810	11/27/2012	11	Irrig	12:20:00 PM	560	4488.326	272	272
Coal Hollow	KANAB CK AT US89 XING		4951810	1/28/2013	1	NonIrrig	12:45:00 PM	755	6732.488	280	280
Coal Hollow	KANAB CK AT US89 XING		4951810	2/25/2013	2	NonIrrig	3:05:00 PM	520	3590.661	318	318
Coal Hollow	KANAB CK AT US89 XING		4951810	3/25/2013	3	NonIrrig	5:20:00 PM	524	3590.661	308	308
Coal Hollow	KANAB CK AT US89 XING		4951810	4/24/2013	4	Irrig	7:15:00 AM	528	3590.661	466	466
Coal Hollow	KANAB CK AT US89 XING		4951810	5/28/2013	5	Irrig	10:15:00 AM	509	3590.661	310	310
Coal Hollow	KANAB CK AT US89 XING		4951810	6/28/2013	6	Irrig	3:30:00 PM	410	2692.995	300	300
Coal Hollow	KANAB CK AT US89 XING		4951810	7/29/2013	7	Irrig	5:50:00 PM	769	3590.661	290	290
Coal Hollow	KANAB CK AT US89 XING		4951810	8/29/2013	8	Irrig	11:45:00 AM	547	2244.163	356	356
Coal Hollow	KANAB CK AT US89 XING		4951810	9/25/2013	9	Irrig	9:30:00 AM	559	2692.995	518	518
Coal Hollow	KANAB CK AT US89 XING		4951810	10/29/2013	10	Irrig	2:45:00 PM	539	3590.661	324	324
Coal Hollow	KANAB CK AT US89 XING		4951810	11/20/2013	11	Irrig	2:30:00 PM	134	3590.661	300	300
Coal Hollow	KANAB CK AT US89 XING		4951810	1/2/2014	1	NonIrrig	3:30:00 PM	165	3590.661	286	286
Coal Hollow	KANAB CK AT US89 XING		4951810	1/30/2014	1	NonIrrig	6:00:00 PM	737	3590.661	384	384
Coal Hollow	KANAB CK AT US89 XING		4951810	2/25/2014	2	NonIrrig	1:50:00 PM	549	3590.661	334	334

TEST	SITENAME	SITE		DATE	MONTH	SEASON	TIME	COND	FLOW	TDS	TDS calc
Coal Hollow	KANAB CK AT US89 XING		4951810	3/28/2014	3	NonIrrig	5:30:00 PM	476	2692.995	292	292
Coal Hollow	KANAB CK AT US89 XING		4951810	4/29/2014	4	Irrig	4:50:00 PM	500	3141.828	288	288
Coal Hollow	KANAB CK AT US89 XING		4951810	5/30/2014	5	Irrig	2:25:00 PM	494	3590.661	288	288
Coal Hollow	KANAB CK AT US89 XING		4951810	7/29/2014	7	Irrig	6:50:00 PM	535	2692.995	330	330
Coal Hollow	KANAB CK AT US89 XING		4951810	8/27/2014	8	Irrig	12:40:00 PM	413	11220.81	314	314
Coal Hollow	KANAB CK AT US89 XING		4951810	10/29/2014	10	Irrig	5:00:00 PM	607	4488.326	374	374
Coal Hollow	KANAB CK AT US89 XING		4951810	1/19/2015	1	NonIrrig	5:10:00 PM	554	3590.661	350	350
Coal Hollow	KANAB CK AT US89 XING		4951810	2/11/2015	2	NonIrrig	1:40:00 PM	553	3590.661	336	336
Coal Hollow	KANAB CK AT US89 XING		4951810	3/9/2015	3	NonIrrig	2:25:00 PM	686	4488.326	438	438
Coal Hollow	KANAB CK AT US89 XING		4951810	4/29/2015	4	Irrig	11:30:00 AM	555	3590.661	328	328
Coal Hollow	KANAB CK AT US89 XING		4951810	6/9/2015	6	Irrig	3:35:00 PM	561	2244.163	320	320
Coal Hollow	KANAB CK AT US89 XING		4951810	7/27/2015	7	Irrig	12:25:00 PM	562	2244.163	352	352
Coal Hollow	KANAB CK AT US89 XING		4951810	8/31/2015	8	Irrig	11:35:00 AM	986	4488.326	352	352
Coal Hollow	KANAB CK AT US89 XING		4951810	11/28/2015	11	Irrig	11:00:00 AM	652	3590.661	354	354
Coal Hollow	KANAB CK AT US89 XING		4951810	1/19/2016	1	NonIrrig	2:50:00 PM	540	3590.661	314	314
Coal Hollow	KANAB CK AT US89 XING		4951810	2/22/2016	2	NonIrrig	2:55:00 PM	734	4488.326	476	476
Coal Hollow	KANAB CK AT US89 XING		4951810	3/28/2016	3	NonIrrig	5:20:00 PM	518	4488.326	290	290
Coal Hollow	KANAB CK AT US89 XING		4951810	4/25/2016	4	Irrig	12:00:00 PM	531	4488.326	324	324
Coal Hollow	KANAB CK AT US89 XING		4951810	5/27/2016	5	Irrig	1:15:00 PM	528	3590.661	322	322
Coal Hollow	KANAB CK AT US89 XING		4951810	7/28/2016	7	Irrig	4:25:00 PM	560	1795.33	328	328
Coal Hollow	KANAB CK AT US89 XING		4951810	8/29/2016	8	Irrig	5:20:00 PM	587	2244.163	352	352
Coal Hollow	KANAB CK AT US89 XING		4951810	9/27/2016	9	Irrig	5:00:00 PM	617	4488.326	364	364