



In collaboration with the  
Yukon River Inter-Tribal Watershed Council

National Research Program

# Water Quality in the Yukon River Basin, Alaska, Water Years 2006 – 2008

By Paul F. Schuster,  
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## Conversion Factors

| Multiply                           | By                     | To obtain                     |
|------------------------------------|------------------------|-------------------------------|
| Length                             |                        |                               |
| nanometer (nm)                     | $3.937 \times 10^{-8}$ | inch (in.)                    |
| micrometer ( $\mu\text{m}$ )       | $3.937 \times 10^{-5}$ | inch (in.)                    |
| kilometer (km)                     | $3.9380 \times 10^4$   | inch (in.)                    |
| meter (m)                          | $3.9380 \times 10^3$   | inch (in.)                    |
| Area                               |                        |                               |
| square kilometer ( $\text{km}^2$ ) | $3.861 \times 10^{-1}$ | square mile ( $\text{mi}^2$ ) |
| Volume                             |                        |                               |
| milliliter                         | $3.82 \times 10^{-2}$  | ounce, fluid                  |
| liter (L)                          | $2.645 \times 10^{-1}$ | gallon                        |
| Mass                               |                        |                               |
| milligram (mg)                     | $3.527 \times 10^{-2}$ | ounce, avoirdupois            |

Temperature in degrees Celsius ( $^{\circ}\text{C}$ ) may be converted to degrees Fahrenheit ( $^{\circ}\text{F}$ ) as follows:

$$^{\circ}\text{F} = (1.8 \times ^{\circ}\text{C}) + 32$$

Vertical coordinate information is referenced in "World Geodetic System 1984" (WGS 84).

Horizontal coordinate information is referenced in World Geodetic System 84 (WGS 84).

Elevation, as used in this report, refers to distance above the vertical datum (WGS 84).

Specific conductance is given in microsiemens per centimeter at 25 degrees Celsius ( $\mu\text{S}/\text{cm}$  at  $25^{\circ}\text{C}$ ).

Concentrations of chemical constituents in water are given either in milligrams per liter (mg/L) or micrograms per liter ( $\mu\text{g}/\text{L}$ ).

Water year refers to the 12-month period October 1 through September 30, designated by the calendar year in which it ends.

NOTE TO USGS USERS: Use of hectare (ha) as an alternative name for square hectometer ( $\text{hm}^2$ ) is restricted to the measurement of small land or water areas. Use of liter (L) as a special name for cubic decimeter ( $\text{dm}^3$ ) is restricted to the measurement of liquids and gases. No prefix other than milli should be used with liter. Metric ton (t) as a name for megagram (Mg) should be restricted to commercial usage, and no prefixes should be used with it.

## Abbreviations and Acronyms

|                         |                                            |
|-------------------------|--------------------------------------------|
| $\mu\text{S}/\text{cm}$ | microsiemens per centimeter                |
| Nm                      | Nanometer                                  |
| DOC                     | Dissolved Organic Carbon                   |
| DIC                     | Dissolved Inorganic Carbon                 |
| SUVA                    | Specific Ultraviolet Absorbance            |
| UV                      | Ultraviolet                                |
| YRB                     | Yukon River Basin                          |
| USGS                    | U.S. Geological Survey                     |
| YRITWC                  | Yukon River Inter-Tribal Watershed Council |
| $\text{CaCO}_3$         | Calcium Carbonate                          |
| DO                      | Dissolved Oxygen                           |
| PPM                     | Parts per million                          |
| $\delta^2\text{D}$      | Deuterium                                  |
| $\delta^{18}\text{D}$   | Oxygen – 18                                |
| $\text{SO}_4$           | Sulfate                                    |
| Cl                      | Chloride                                   |

# Water Quality in the Yukon River Basin, Alaska, Water Years 2006 – 2008

By Paul F. Schuster<sup>1</sup>, Karonhiakta'tie Bryan Maracle<sup>2</sup>, and Nicole Herman-Mercer<sup>3</sup>

## Abstract

The Yukon River Inter-Tribal Watershed Council and the U.S. Geological Survey developed a water-quality monitoring program to address a shared interest in the water quality of the Yukon River and its relation to climate. This report contains water-quality data from samples collected in the Yukon River Basin during water years 2006 through 2008. A broad range of chemical analyses from 44 stations throughout the YRB are presented. On August 8, 2009 the USGS signed a Memorandum of Understanding with the Yukon River Inter-Tribal Watershed Council representing the culmination of 5 years of dedicated efforts to forge a working collaboration and partnership with expectations of continuing into the foreseeable future. The Memorandum of Understanding may be viewed at [http://www.usgs.gov/mou/docs/yritwc\\_mou.pdf](http://www.usgs.gov/mou/docs/yritwc_mou.pdf).

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## Introduction

The Yukon River Basin (YRB) is the fourth largest drainage basin in North America (855,000 km<sup>2</sup>, roughly twice the size of California). The YRB covers subarctic and arctic terrain in Canada and Alaska encompassing more than 20 eco-regions and underlain by continuous and discontinuous permafrost (Brabets and others 2000). As a result of a warming and drying climate (Hinzman and others, 2005), the permafrost is thawing (Jorgenson and others, 2006), and forest fires have been increasing (Kane and others, 2005). Permafrost thaw likely will lead to changes in the water flows (Walvoord and Striegl, 2007), quantity, and quality of the rivers, streams, and lakes (Striegl and others, 2005; 2007). Such large-scale environmental changes can be expected to have important consequences for the hydrology and water quality of the Yukon River and its major tributaries. Moreover, these fundamental physical and chemical changes may ultimately affect the migratory routes of spawning salmon and animals such as moose and water fowl.

In 2000, the U.S. Geological Survey (USGS) began a landmark study of the Yukon River and its major tributaries. A key objective of this study is to establish a baseline data set of water quality, which will serve as an important frame of reference to assess future changes in the basin. In an effort to continue baseline water-quality data collection critical to the assessment of climate change effects in the Yukon River Basin, a partnership was forged between the USGS and the Yukon River Inter-Tribal Watershed Council (YRITWC) in 2005. The foundation of this partnership is a shared interest in the current (2010) and future water quality of the Yukon River and its relation to climate.

In collaboration with the USGS, the YRITWC developed a water-quality monitoring program that utilizes the USGS sampling and monitoring protocols (U.S. Geological Survey, variously dated). Water-quality samplings include the in-situ measurement of pH, conductance, temperature, and dissolved oxygen in addition to the collection and processing of a suite of water samples for laboratory analyses by the USGS. In conjunction with the YRITWC field campaign, and critical to the success of the program, the

USGS National Research Program laboratories in Boulder, Colorado provided analytical support, measuring dissolved organic carbon, dissolved greenhouses gases, major ions, nutrients, trace metals, and water isotopes.

This report contains the water-quality data collected by the YRITWC/USGS partnership from Water Year (WY)2006 through WY2008 at 44 stations throughout the YRB (figure 1, table 1). This report has also been released in paper format to meet both archival and data dissemination objectives. This is the eighth report in a series of USGS Open-File Reports (OFR) publishing water-quality data for the YRB beginning in WY2001. The first seven OFRs can be found at:

*<http://pubs.usgs.gov/of/2003/ofr03427> (Schuster, 2003)*

*<http://pubs.usgs.gov/of/2005/1199/> (Schuster, 2005)*

*<http://pubs.usgs.gov/of/2005/1397/> (Schuster, 2005)*

*<http://pubs.usgs.gov/of/2006/1258/> (Schuster, 2006)*

*<http://pubs.usgs.gov/of/2006/1228/> (Dornblaser and Halm, 2006)*

*<http://pubs.usgs.gov/of/2007/1037/> (Schuster, 2007)*

*<http://pubs.usgs.gov/of/2007/1197/> (Halm and Dornblaser, 2007)*

The sample-collection methods and the laboratory analytical methods are described in Schuster and others (2003) (*<http://pubs.usgs.gov/of/2003/ofr03427>*). A summary of analytical methods used in WY2006-2008 is provided in table 2. The water-quality data are also available online at:

*<http://yritwc.dsys.ca/>*

## Sample Locations and Analytical Methods

Tables 1 and 2 provide the coordinates and elevations of all the monitoring stations locations and references to the analytical methods used for each constituent measured (tables 1 and 2). Monitoring stations include four USGS streamflow – gaging stations where continuous streamflow data are available: Yukon River at Eagle, Tanana River at Nenana, Yukon River at Bridge, and Yukon River at Pilot Station (USGS National Water Information System, <http://waterdata.usgs.gov/nwis>).

**Table 1.** Summary of site characteristics at monitoring stations in the Yukon River Basin.

[YRITWC Station ID, Yukon River Inter-Tribal Watershed Council station identification; sq.mi., square miles; DD.ddd, Decimal Degrees]

| YRITWC<br>Station ID | Station<br>number<br>on<br>figure 1 | Station name                      | Latitude (DD.ddd) | Longitude (DD.ddd) | Elevation<br>(meters) |
|----------------------|-------------------------------------|-----------------------------------|-------------------|--------------------|-----------------------|
| atysqla              | 1                                   | Atlin Lake above Atlin            | 59.43835          | -133.6704          | 671                   |
| atysqlb              | 2                                   | Atlin River                       | 59.598833         | -133.815056        | 671                   |
| becfa1a              | 3                                   | Bennet Lake Outlet                | 60.162931         | -134.715083        | 11                    |
| teyzw1a              | 4                                   | Teslin Lake                       | 60.08665          | -132.6006          | 688                   |
| teyzw1b              | 5                                   | Teslin River                      | 60.481972         | -133.289972        | 694                   |
| tacfa1b              | 6                                   | Tagish River                      | 60.293428         | -134.262472        | 653                   |
| yuyxy1a              | 7                                   | Yukon River above Whitehorse      | 60.5735           | -134.669556        | 652                   |
| yuyxy1b              | 8                                   | Yukon River below Whitehorse      | 60.839186         | -135.180167        | 633                   |
| yucex1a              | 9                                   | Yukon River at Carmacks           | 62.117628         | -136.262678        | 540                   |
| whyda1a              | 10                                  | White River                       | 63.191778         | -139.591778        | 366                   |
| stymala              | 11                                  | Stewart River                     | 63.586514         | -135.859764        | 519                   |
| yuyda1a              | 12                                  | Yukon River at Dawson             | 64.028337         | -139.478131        | 262                   |
| yueaala              | 13                                  | Yukon River at Eagle <sup>1</sup> | 64.786133         | -141.17875         | 259                   |

<sup>1</sup> USGS streamflow–gaging station, streamflow and water-quality measurements collected at the same station.

**Table 1.** Summary of site characteristics at sampling stations in the Yukon River Basin.—Continued

| Station ID | ID on figure 1 | Station name                        | Latitude (DD.ddd) | Longitude (DD.ddd) | Elevation (meters) |
|------------|----------------|-------------------------------------|-------------------|--------------------|--------------------|
| yucrc1a    | 14             | Yukon River at Circle               | 65.7609           | -144.014183        | 170                |
| tanen1a    | 15             | Tanana River at Nenena <sup>1</sup> | 64.566267         | -149.09145         | 118                |
| tafai3a    | 16             | Tanana River above Eilson           | 64.33928          | -146.867467        | 227                |
| tafai2a    | 17             | Tanana River near Salcha            | 64.5355           | -147.0235          | 188                |
| tafai1b    | 18             | Tanana River below Chena River      | 64.79325          | -147.954217        | 130                |
| chfai5a    | 19             | Upper Chena River                   | 64.8458           | -147.3305          | 139                |
| chfai6a    | 20             | Chena River above Fairbanks         | 64.847033         | -147.40735         | 139                |
| chfai1b    | 21             | Chena River Mouth                   | 64.7983           | -147.9112          | 137                |
| cld661a    | 22             | Clearwater River                    | 64.054            | -145.4332          | 320                |
| hefai1a    | 23             | Hess Creek                          | 65.665797         | -149.096603        | 137                |
| pofyu1a    | 24             | Porcupine River above Fort Yukon    | 66.592778         | -145.278611        | 127                |
| yufyu1a    | 25             | Yukon River at Fort Yukon           | 66.5588           | -145.2776          | 130                |
| chvee1a    | 26             | Chandler River above Venetie        | 67.019133         | -146.430367        | 175                |
| yubri1a    | 27             | Yukon River at Bridge <sup>1</sup>  | 65.876033         | -149.717917        | 80                 |
| yurby1a    | 28             | Yukon River at Ruby                 | 64.7439           | -155.4935          | 47                 |
| yugall1a   | 29             | Yukon River above Galena            | 64.719778         | -156.752639        | 142                |
| kohsl1a    | 30             | Koyukuk River above Huslia          | 65.7012           | -156.4111          | 47                 |
| kohsl2a    | 31             | Koyukuk River above Huslia site 2   | 65.993678         | -155.399533        | 61                 |
| kokyul1a   | 32             | Koyukuk River at mouth              | 64.925228         | -157.535814        | 35                 |
| hohsl1a    | 33             | Hog River                           | 65.9961           | -155.3461          | 67                 |
| ananv1a    | 34             | Anvik River                         | 62.6667           | -160.281667        | 30                 |

**Table 1.** Summary of site characteristics at sampling stations in the Yukon River Basin.—Continued

| Station ID | ID on figure 1 | Station name                                 | Latitude (DD.ddd) | Longitude (DD.ddd) | Elevation (meters) |
|------------|----------------|----------------------------------------------|-------------------|--------------------|--------------------|
| yuanv1a    | 35             | Yukon River at Anvik                         | 62.7053           | -160.107317        | 16                 |
| yursh1a    | 36             | Yukon River at Russian Mission               | 61.783155         | -161.305888        | 28                 |
| yumll1a    | 37             | Yukon River above Marshall                   | 61.83875          | -162.141806        | 4                  |
| yupqs1a    | 38             | Yukon River above Pilot Station <sup>1</sup> | 61.950402         | -162.834483        | 7                  |
| yuksm1a    | 39             | Yukon River above St. Mary's                 | 62.018333         | -163.223733        | 7                  |
| anksm1a    | 40             | North Fork Andreafsky River at St. Mary's    | 62.0598           | -163.1202          | 20                 |
| yuemn1a    | 41             | Yukon River above Emmonak                    | 62.75877          | -164.479556        | 0                  |
| nivak1a    | 42             | Ningliqvvak River above Chevak               | 61.546111         | -165.573889        | 9.1                |
| yukot1a    | 43             | Yukon River above Kotlik                     | 63.041389         | -163.669722        | 3                  |
| clwbb1a    | 44             | Clear Lake at Stebbins                       | 63.49827          | -162.2311667       | 1.8                |

**Table 2.** Summary of standard analytical methods and references.

[UV, Ultraviolet; nm, nanometer; USGS, U.S. Geological Survey; ISO, International Organization for Standardization]

| Constituent                   | Reference                                   | Method of analysis                                         |
|-------------------------------|---------------------------------------------|------------------------------------------------------------|
| Oxygen, dissolved             | USGS (1997 – 1999)                          | Amperometric                                               |
| pH, whole water               | USGS (1997 – 1999)                          | Electrometric electrode                                    |
| Specific conductance          | USGS (1997 – 1999)                          | Wheatstone bridge                                          |
| Calcium, dissolved            | ISO 14911 – 1 (1998 <sup>1</sup> )          | Ion chromatography                                         |
| Magnesium, dissolved          | ISO 14911 – 1 (1998)                        | Ion chromatography                                         |
| Potassium, dissolved          | ISO 14911 – 1 (1998)                        | Ion chromatography                                         |
| Ammonium, dissolved           | ISO 14911 – 1 (1998)                        | Ion chromatography                                         |
| Sodium, dissolved             | ISO 14911 – 1 (1998)                        | Ion chromatography                                         |
| Alkalinity                    | USGS (1997 – 1999)                          | Incremental endpoint point titration                       |
| Chloride, dissolved           | Fishman and Friedman (1989); Fishman (1993) | Ion chromatography                                         |
| Sulfate, dissolved            | Fishman and Friedman (1989); Fishman (1993) | Ion chromatography                                         |
| Carbon, organic,<br>Dissolved | Brenton and Arnett (1993)                   | Wet-chemical oxidation,<br>nondispersive infrared detector |
| UV absorbance, 254 nm         | Chin and others (1994)                      | UV absorbance, 254 nm                                      |
| Carbon Dioxide                | Striegl and others (2001)                   | nondispersive infrared detector                            |
| Dissolved inorganic carbon    | Striegl and others (2001)                   | nondispersive infrared detector                            |
| Methane                       | Striegl and Michmerhuizen (1998)            | Gas chromatography                                         |
| Deuterium                     | Coplen, Wildman, and Chen (1991)            | Gaseous hydrogen equilibration                             |
| Oxygen-18                     | Epstein and Mayeda (1953)                   | Carbon dioxide-water equilibration                         |

<sup>1</sup> The employed ISO analytical procedures were performed for dissolved Na<sup>+</sup>, NH<sub>4</sub><sup>+</sup>, K<sup>+</sup>, Mn<sup>2+</sup>, Mg<sup>2+</sup> according to the current Polish standards issued by the Polish Committee for Standardization using ion chromatography method (ISO 149-1:1998; [www.iso.org/](http://www.iso.org/)).

## Water-Quality Data 2006 – 2008

Field and laboratory water quality data for 44 stations throughout the YRB for three consecutive water years (2006-2008) are reported in tables 3-46 (located at the back of this report). Measurements made in the field included air and water temperature, dissolved oxygen (DO), and specific conductance. Laboratory measurements were made for 16 constituents including major ions, selected nutrients, dissolved organic and inorganic carbon, ultraviolet absorbance (UV), greenhouse gasses, and water isotopes. The number of stations sampled during each water year varied from 20 to 32. The number of samplings at each station varied during each water year to as few as 1 to as many as 10.

The ion balance reported in tables 3 through 46 (located at the back of this report) is a calculation used to assess the validity of analytical results. The total major anions (chloride, nitrate, sulfate, and bicarbonate or alkalinity) must be in balance with the total major cations (sodium, ammonium, potassium, magnesium, and calcium). In this report the ion balance is expressed in percent as the difference between the sum of the cations and the sum of the anions (in equivalents per liter) divided by the total sum of the major ions. Generally, in this report, ion balances of less than 10 percent are considered acceptable and the analytical results are valid. Ion balances greater than 10 percent indicate an anion or cation deficit or surplus. Only 13 of 402 samples analyzed over the 3 water years had an ion balance of greater than 10 percent. Based on a comparison of historical results for samples with greater than a 10 percent ion balance, selected ions have been flagged with an asterisk in tables 26, 30, 36, 41, and 42 (located at the back of this report) as the probable cause for the poor ion balance. Additionally, some values in tables 3 through 46 (located at the back of this report) have been flagged with an E to represent that the value is an estimate. These values are considered estimates because they fall between the

instrument detection and quantitation limits. The instrument detection limit is calculated from a statistical procedure adopted from Skogerboe and Grant (1970). The quantitation limit is defined as the lowest standard used for the calibration curve. Other values have been flagged as less than (<) because they fall below the detection limit.

## Water-Quality Data 2006 – 2008

**Table 3.** Water quality, field measurements, and laboratory analyses – Atlin Lake above Atlin, Canada.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality assurance/quality control section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| atysq1a              | 9445              | 6/23/2008 11:00  | Open water     | 14.7                                  | 7.30                                    | 12.9               | 7.96                               | 94.5                                                |
| atysq1a              | 9719              | 7/7/2008 12:05   | Open water     | 15.1                                  | 8.70                                    | 12.1               | 7.70                               | 98.3                                                |
| atysq1a              | 9858              | 8/8/2008 13:45   | Open water     | 21.7                                  | 10.0                                    | 11.4               | 7.45                               | --                                                  |
| atysq1a              | 9890              | 8/21/2008 14:50  | Open water     | 18.8                                  | 11.2                                    | 10.6               | 8.33                               | 101                                                 |

**Table 3.** Water quality, field measurements, and laboratory analyses – Atlin Lake above Atlin, Canada.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units)    | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L)     | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|----------------------|--------------------|--------------------------|-------------------|
| atysqla              | 9445              | 6/23/2008 11:00  | 7.83                             | 0.9E                | 78.5                 | 765.8              | 251.6                    | 40.20             |
| atysqla              | 9719              | 7/7/2008 12:05   | 7.96                             | <0.9                | 10.4                 | 762.5              | 217.0                    | 203.2             |
| atysqla              | 9858              | 8/8/2008 13:45   | 7.96                             | <0.9                | 6.10                 | 812.8              | 236.4                    | 180.9             |
| atysqla              | 9890              | 8/21/2008 14:50  | 7.89                             | <0.9                | 8.80                 | 811.2              | 234.8                    | 204.9             |
|                      |                   |                  |                                  |                     |                      |                    |                          |                   |
| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L)   | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |                   |
| atysqla              | 9445              | 6/23/2008 11:00  | 847.8                            | 57.9                | 2.20                 | 86.00              | -1                       |                   |
| atysqla              | 9719              | 7/7/2008 12:05   | 974.4                            | 26.9                | 0.70                 | 129.5              | -1                       |                   |
| atysqla              | 9858              | 8/8/2008 13:45   | 969.5                            | 28.5                | <0.20                | 173.2              | -1                       |                   |
| atysqla              | 9890              | 8/21/2008 14:50  | 1,003                            | 23.2                | <0.20                | 167.9              | 5                        |                   |

**Table 3.** Water quality, field measurements, and laboratory analyses – Atlin Lake above Atlin, Canada.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| atysq1a                 | 9445                 | 6/23/2008 11:00  | 0.012                         | 1.3  | 0.90                                  | --                         | 1,280                                   | 2.9              | -142.0             | -18.37                |
| atysq1a                 | 9719                 | 7/7/2008 12:05   | 0.010                         | 1.1  | 0.90                                  | n/a                        | n/a                                     | n/a              | -142.6             | -18.52                |
| atysq1a                 | 9858                 | 8/8/2008 13:45   | 0.009                         | 1.1  | 0.80                                  | n/a                        | n/a                                     | n/a              | -144.6             | -17.90                |
| atysq1a                 | 9890                 | 8/21/2008 14:50  | 0.011                         | 1.0  | 1.10                                  | --                         | --                                      | --               | -146.6             | -18.10                |

**Table 4.** Water quality, field measurements, and laboratory analyses – Atlin River, Canada.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type                | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|-------------------------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| atysq1b              | 9446              | 6/23/2008 12:00  | Open water                    | 11.0                  | 5.00                    | 13.3               | 7.88                               | 94.5                            |
| atysq1b              | 9717              | 7/7/2008 13:20   | Open water                    | 15.9                  | 7.50                    | 12.6               | 7.45                               | 99.7                            |
| atysq1b              | 9859              | 8/8/2008 14:50   | Open water                    | 17.1                  | 10.5                    | 11.4               | 7.60                               | 99.9                            |
| atysq1b              | 9895              | 8/21/2008 13:30  | Open water                    | 19.5                  | 11.7                    | 10.3               | 8.21                               | 101                             |
| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L)   | Potassium<br>(µeq/L)    | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L)               | Sodium<br>(µeq/L)               |
| atysq1b              | 9446              | 6/23/2008 12:00  | 7.75                          | <0.9                  | 18.7                    | 775.0              | 266.0                              | 53.60                           |
| atysq1b              | 9717              | 7/7/2008 13:20   | 8.05                          | <0.9                  | 8.70                    | 771.4              | 218.3                              | 154.0                           |
| atysq1b              | 9859              | 8/8/2008 14:50   | 8.08                          | <0.9                  | 7.90                    | 812.4              | 239.1                              | 167.2                           |
| atysq1b              | 9895              | 8/21/2008 13:30  | 7.83                          | <0.9                  | 7.10                    | 803.7              | 240.9                              | 217.6                           |

**Table 4.** Water quality, field measurements, and laboratory analyses – Atlin River, Canada.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) |  | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |  |
|----------------------|-------------------|------------------|----------------------------------|--|---------------------|--------------------|--------------------|--------------------------|--|
| atysq1b              | 9446              | 6/23/2008 12:00  | 1,438                            |  | 9.00                | 1.80               | 135.7              | --                       |  |
| atysq1b              | 9717              | 7/7/2008 13:20   | 966.9                            |  | 17.8                | 0.70               | 118.3              | -2                       |  |
| atysq1b              | 9859              | 8/8/2008 14:50   | 970.8                            |  | 22.5                | <0.20              | 164.9              | -2                       |  |
| atysq1b              | 9895              | 8/21/2008 13:30  | 1,014                            |  | 21.8                | <0.20              | 163.4              | 3                        |  |

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | δ <sup>2</sup> D | δ <sup>18</sup> O |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|------------------|-------------------|
| atysq1b                 | 9446                 | 6/23/2008 12:00  | 0.013                         | 1.3  | 1                                     | 500                        | 1,330                                   | 3.7              | -143.8           | -18.49            |
| atysq1b                 | 9717                 | 7/7/2008 13:20   | 0.012                         | 1.5  | 0.8                                   | n/a                        | n/a                                     | n/a              | -143.7           | -18.44            |
| atysq1b                 | 9859                 | 8/8/2008 14:50   | 0.009                         | 1    | 0.9                                   | n/a                        | n/a                                     | n/a              | -143.8           | -18.20            |
| atysq1b                 | 9895                 | 8/21/2008 13:30  | 0.013                         | 1.1  | 1.2                                   | --                         | --                                      | --               | -144.7           | -17.50            |

**Table 5.** Water quality, field measurements, and laboratory analyses – Bennet Lake Outlet, Canada.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million; δ <sup>2</sup> D, deuterium; δ <sup>18</sup> O, oxygen-18; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| becfa1a              | 9429              | 6/10/2008 14:45  | Open water     | 10.5                  | 5.00                    | 12.8               | 7.42                               | 68.9                            |
| becfa1a              | 9472              | 6/24/2008 10:00  | Open water     | 13.0                  | 6.40                    | 12.5               | 7.56                               | 68.3                            |
| becfa1a              | 9477              | 7/1/2008 11:26   | Open water     | 11.8                  | 7.40                    | 12.4               | 7.55                               | 69.6                            |
| becfa1a              | 9751              | 7/15/2008 9:50   | Open water     | 14.5                  | 8.40                    | 11.8               | 7.50                               | 68.1                            |
| becfa1a              | 9771              | 7/29/2008 10:50  | Open water     | 21.5                  | 8.60                    | 13.7               | 7.39                               | 65.2                            |
| becfa1a              | 9892              | 8/25/2008 11:40  | Open water     | 12.4                  | 10.0                    | 11.2               | 7.01                               | 553.1                           |

**Table 5.** Water quality, field measurements, and laboratory analyses – Bennet Lake Outlet, Canada.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units)    | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L)     | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|----------------------|--------------------|--------------------------|-------------------|
| becfala              | 9429              | 6/10/2008 14:45  | 7.33                             | <0.9                | 12.0                 | 542.2              | 109.7                    | 104.7             |
| becfala              | 9472              | 6/24/2008 10:00  | 6.24                             | <0.9                | 11.3                 | 550.9              | 111.4                    | 60.20             |
| becfala              | 9477              | 7/1/2008 11:26   | 7.06                             | <0.9                | 12.1                 | 563.3              | 123.0                    | 51.00             |
| becfala              | 9751              | 7/15/2008 9:50   | 7.70                             | <0.9                | 12.3                 | 576.0              | 100.3                    | 48.80             |
| becfala              | 9771              | 7/29/2008 10:50  | 7.85                             | --                  | --                   | --                 | --                       | --                |
| becfala              | 9892              | 8/25/2008 11:40  | 7.31                             | <0.9                | 15.8                 | 606.6              | 106.8                    | 58.40             |
| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L)   | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |                   |
| becfala              | 9429              | 6/10/2008 14:45  | 572.6                            | 20.5                | 22.7                 | 143.9              | 0                        |                   |
| becfala              | 9472              | 6/24/2008 10:00  | 541.5                            | 9.50                | 3.9                  | 124.8              | 4                        |                   |
| becfala              | 9477              | 7/1/2008 11:26   | 546.5                            | 9.00                | 4.3                  | 130.6              | 2                        |                   |
| becfala              | 9751              | 7/15/2008 9:50   | 541.0                            | 7.30                | 3.4                  | 123.4              | -1                       |                   |
| becfala              | 9771              | 7/29/2008 10:50  | 596.7                            | 10.4                | 3.6                  | 122.9              | 8                        |                   |
| becfala              | 9892              | 8/25/2008 11:40  | 553.1                            | <0.9                | 58.40                | 15.8               | -1                       |                   |

**Table 5.** Water quality, field measurements, and laboratory analyses – Bennet Lake Outlet, Canada.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| becfala                 | 9429                 | 6/10/2008 14:45  | 0.026                         | 1.9  | 1.40                                  | 16                         | 650                                     | 6.2              | -144.9               | -19.00                |
| becfala                 | 9472                 | 6/24/2008 10:00  | 0.028                         | 2.1  | 1.3                                   | n/a                        | n/a                                     | n/a              | -145.1               | -18.97                |
| becfala                 | 9477                 | 7/1/2008 11:26   | 0.025                         | 2.0  | 1.2                                   | n/a                        | n/a                                     | n/a              | -145.5               | -18.96                |
| becfala                 | 9751                 | 7/15/2008 9:50   | 0.027                         | 2.0  | 1.4                                   | n/a                        | n/a                                     | n/a              | -145.6               | -18.99                |
| becfala                 | 9771                 | 7/29/2008 10:50  | 0.023                         | 2.0  | 1.2                                   | n/a                        | n/a                                     | n/a              | -145.9               | -18.94                |
| becfala                 | 9892                 | 8/25/2008 11:40  | 0.027                         | 1.8  | 1.50                                  | --                         | 565                                     | 5.8              | -147.9               | -18.90                |

**Table 6.** Water quality, field measurements, and laboratory analyses – Teslin Lake, Canada.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type                | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|-------------------------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| teyzw1a              | 9442              | 6/12/2008 10:51  | Open water                    | 15.6                  | 6.10                    | 11.9               | 8.14                               | 77.4                            |
| teyzw1a              | 9716              | 7/2/2008 15:20   | Open water                    | 22.9                  | 10.0                    | 11.5               | 7.98                               | 117                             |
| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L)   | Potassium<br>(µeq/L)    | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L)               | Sodium<br>(µeq/L)               |
| teyzw1a              | 9442              | 6/12/2008 10:51  | 7.82                          | 0.9E                  | 14.9                    | 886.8              | 401.5                              | 75.20                           |
| teyzw1a              | 9716              | 7/2/2008 15:20   | 7.96                          | <0.9                  | 15.4                    | 874.2              | 318.9                              | 63.30                           |

**Table 6.** Water quality, field measurements, and laboratory analyses – Teslin Lake, Canada.—Continued

| YRITWC<br>Station ID    | USGS<br>sample ID    | Date<br>and time | Laboratory alkalinity<br>(µeq/L) |      | Chloride<br>(µeq/L)                   | Nitrate<br>(µeq/L)         | Sulfate<br>(µeq/L)                      | Ion Balance<br>(Percent) |                  |                   |
|-------------------------|----------------------|------------------|----------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|--------------------------|------------------|-------------------|
| teyzw1a                 | 9442                 | 6/12/2008 10:51  | 1110                             |      | 8.20                                  | 3.60                       | 89.40                                   | 6                        |                  |                   |
| teyzw1a                 | 9716                 | 7/2/2008 15:20   | 1049                             |      | 7.00                                  | 1.20                       | 115.8                                   | 4                        |                  |                   |
|                         |                      |                  |                                  |      |                                       |                            |                                         |                          |                  |                   |
| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm    | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm)         | δ <sup>2</sup> D | δ <sup>18</sup> O |
| teyzw1a                 | 9442                 | 6/12/2008 10:51  | 0.120                            | 3.1  | 3.90                                  | 684                        | 1,580                                   | 3.6                      | -158.5           | -20.20            |
| teyzw1a                 | 9716                 | 7/2/2008 15:20   | 0.130                            | 3.1  | 4.30                                  | n/a                        | n/a                                     | n/a                      | -158.9           | -20.34            |

**Table 7.** Water quality, field measurements, and laboratory analyses – Teslin River, Canada.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| teyzw1b              | 9754              | 7/10/2008 10:45  | Open water     | 14.2                  | 11.5                    | 10.9               | 7.92                               | 98.9                            |
| teyzw1b              | 9766              | 7/24/2008 10:10  | Open water     | 16.3                  | 11.3                    | 10.5               | 8.27                               | 130                             |
| teyzw1b              | 9827              | 8/6/2008 10:15   | Open water     | 19.3                  | 13.8                    | 10.5               | 7.89                               | 136                             |
| teyzw1b              | 9870              | 9/4/2008 10:30   | Open water     | 11.5                  | 11.4                    | 10.0               | 8.00                               | 137                             |
| teyzw1b              | 9882              | 8/21/2008 10:55  | Open water     | 13.7                  | 12.9                    | 10.2               | 7.92                               | 197                             |

**Table 7.** Water quality, field measurements, and laboratory analyses – Teslin River, Canada.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| teyzw1b              | 9754              | 7/10/2008 10:45  | 8.20                          | <0.9                | 21.7                 | 981.7              | 400.0                | 79.30             |
| teyzw1b              | 9766              | 7/24/2008 10:10  | 8.10                          | <0.9                | 8.00                 | 1,042              | 397.2                | 208.1             |
| teyzw1b              | 9827              | 8/6/2008 10:15   | 8.24                          | <0.9                | 15.1                 | 1,023              | 415.7                | 82.50             |
| teyzw1b              | 9870              | 9/4/2008 10:30   | 8.21                          | <0.9                | 7.30                 | 1,022              | 416.9                | 220.4             |
| teyzw1b              | 9882              | 8/21/2008 10:55  | 8.22                          | <0.9                | 16.8                 | 1,085              | 432.3                | 76.70             |

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| teyzw1b              | 9754              | 7/10/2008 10:45  | 1,202                            | 14.0                | 0.20E              | 164.4              | 4                        |
| teyzw1b              | 9766              | 7/24/2008 10:10  | 1,326                            | 19.4                | 0.50E              | 163.9              | 2                        |
| teyzw1b              | 9827              | 8/6/2008 10:15   | 1,262                            | 5.60                | <0.20              | 227.8              | 3                        |
| teyzw1b              | 9870              | 9/4/2008 10:30   | 1,373                            | 25.3                | <0.20              | 222.8              | 1                        |
| teyzw1b              | 9882              | 8/21/2008 10:55  | 1,302                            | 3.80                | <0.20              | 243.7              | 2                        |

**Table 7.** Water quality, field measurements, and laboratory analyses – Teslin River, Canada.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| teyzw1b                 | 9754                 | 7/10/2008 10:45  | 0.133                         | 3.1  | 4.30                                  | n/a                        | n/a                                     | n/a              | -158.5             | -20.20                |
| teyzw1b                 | 9766                 | 7/24/2008 10:10  | 0.121                         | 3.0  | 4.00                                  | n/a                        | n/a                                     | n/a              | -158.9             | -20.34                |
| teyzw1b                 | 9827                 | 8/6/2008 10:15   | 0.111                         | 2.8  | 3.90                                  | n/a                        | n/a                                     | n/a              | -161.2             | -20.66                |
| teyzw1b                 | 9870                 | 9/4/2008 10:30   | 0.109                         | 2.9  | 3.80                                  | 888                        | 1,790                                   | 5.5              | -160.2             | -20.52                |
| teyzw1b                 | 9882                 | 8/21/2008 10:55  | 0.108                         | 2.8  | 3.80                                  | n/a                        | n/a                                     | n/a              | -158.1             | -20.38                |

**Table 8.** Water quality, field measurements, and laboratory analyses – Tagish River, Canada.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| tacfa1b              | 9428              | 6/10/2008 13:20  | Open water     | 10.4                  | 7.00                    | 12.2               | 7.82                               | 87.3                            |
| tacfa1b              | 9473              | 7/1/2008 12:45   | Open water     | 20.5                  | 10.9                    | 11.4               | 7.66                               | 87.0                            |
| tacfa1b              | 9474              | 6/24/2008 11:15  | Open water     | 15.0                  | 9.80                    | 11.5               | 7.67                               | 86.9                            |
| tacfa1b              | 9753              | 7/15/2008 11:17  | Open water     | 14.1                  | 11.9                    | 10.7               | 7.74                               | 87.0                            |
| tacfa1b              | 9772              | 7/29/2008 12:35  | Open water     | 17.1                  | 11.7                    | 11.5               | 7.92                               | 82.5                            |
| tacfa1b              | 9884              | 8/25/2008 14:02  | Open water     | 11.7                  | 11.6                    | 10.4               | 7.62                               | 86.1                            |

**Table 8.** Water quality, field measurements, and laboratory analyses – Tagish River, Canada.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| tacfa1b              | 9428              | 6/10/2008 13:20  | 7.58                          | <0.9                | 14.7                 | 702.2              | 190.5                | 110.6             |
| tacfa1b              | 9473              | 7/1/2008 12:45   | 8.04                          | <0.9                | 13.7                 | 681.7              | 189.0                | 41.80             |
| tacfa1b              | 9474              | 6/24/2008 11:15  | 7.02                          | <0.9                | 13.9                 | 677.8              | 185.6                | 55.00             |
| tacfa1b              | 9753              | 7/15/2008 11:17  | 7.96                          | 8.1                 | 17.6                 | 724.1              | 179.4                | 44.20             |
| tacfa1b              | 9772              | 7/29/2008 12:35  | 8.01                          | <0.9                | 7.90                 | 705.3              | 174.0                | 169.4             |
| tacfa1b              | 9884              | 8/25/2008 14:02  | 8.08                          | <0.9                | 18.7                 | 721.9              | 180.4                | 41.30             |

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| tacfa1b              | 9428              | 6/10/2008 13:20  | 804.9                            | 13.1                | <0.20              | 147.4              | 4                        |
| tacfa1b              | 9473              | 7/1/2008 12:45   | 726.2                            | 7.20                | 0.30E              | 129.8              | 4                        |
| tacfa1b              | 9474              | 6/24/2008 11:15  | 739.2                            | 9.00                | 0.50E              | 90.00              | 5                        |
| tacfa1b              | 9753              | 7/15/2008 11:17  | 744.4                            | 6.80                | <0.20              | 130.5              | 3                        |
| tacfa1b              | 9772              | 7/29/2008 12:35  | 843.3                            | 19.7                | 0.60E              | 129.0              | 4                        |
| tacfa1b              | 9884              | 8/25/2008 14:02  | 754.2                            | 4.10                | <0.20              | 172.0              | 2                        |

**Table 8.** Water quality, field measurements, and laboratory analyses – Tagish River, Canada.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| tacfa1b                 | 9428                 | 6/10/2008 13:20  | 0.016                         | 1.3  | 1.20                                  | 207                        | 877                                     | 4.6              | -143.9               | -18.60                |
| tacfa1b                 | 9473                 | 7/1/2008 12:45   | 0.018                         | 1.4  | 1.30                                  | n/a                        | n/a                                     | n/a              | -145.2               | -18.57                |
| tacfa1b                 | 9474                 | 6/24/2008 11:15  | 0.016                         | 1.5  | 1.00                                  | n/a                        | n/a                                     | n/a              | -140.5               | -18.46                |
| tacfa1b                 | 9753                 | 7/15/2008 11:17  | 0.017                         | 1.4  | 1.20                                  | n/a                        | n/a                                     | n/a              | -142.3               | -18.58                |
| tacfa1b                 | 9772                 | 7/29/2008 12:35  | 0.014                         | 1.4  | 1.00                                  | n/a                        | n/a                                     | n/a              | -143.2               | -18.59                |
| tacfa1b                 | 9884                 | 8/25/2008 14:02  | 0.017                         | 1.4  | 1.20                                  | --                         | --                                      | --               | -145.6               | -18.70                |

**Table 9.** Water quality, field measurements, and laboratory analyses – Yukon River above Whitehorse, Canada.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million; δ <sup>2</sup> D, deuterium; δ <sup>18</sup> O, oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/ quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yuyxyla              | 9426              | 6/4/2008 15:30   | Open water     | 15.0                  | 8.50                    | 11.4               | 8.07                               | 105                             |
| yuyxyla              | 9469              | 6/24/2008 13:00  | Open water     | 15.5                  | 11.5                    | 10.6               | 7.77                               | 104                             |
| yuyxyla              | 9478              | 7/1/2008 15:16   | Open water     | 25.3                  | 13.3                    | 10.4               | 7.83                               | 105                             |
| yuyxyla              | 9752              | 7/15/2008 12:53  | Open water     | --                    | 14.3                    | 9.90               | 7.88                               | 101                             |
| yuyxyla              | 9773              | 7/29/2008 14:10  | Open water     | 21.1                  | 13.2                    | 10.8               | --                                 | 94.9                            |
| yuyxyla              | 9893              | 8/25/2008 15:30  | Open water     | --                    | 12.9                    | 9.80               | 7.47                               | 105                             |

**Table 9.** Water quality, field measurements and laboratory analyses – Yukon River above Whitehorse, Canada.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units)    | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L)     | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|----------------------|--------------------|--------------------------|-------------------|
| yuyxyla              | 9426              | 6/4/2008 15:30   | 7.93                             | <0.9                | 12.7                 | 860.4              | 272.3                    | 120.2             |
| yuyxyla              | 9469              | 6/24/2008 13:00  | 8.03                             | <0.9                | 14.3                 | 823.9              | 261.5                    | 60.80             |
| yuyxyla              | 9478              | 7/1/2008 15:16   | 8.13                             | <0.9                | 14.1                 | 824.3              | 268.1                    | 47.10             |
| yuyxyla              | 9752              | 7/15/2008 12:53  | 8.09                             | 1.4E                | 15.8                 | 827.6              | 229.4                    | 45.40             |
| yuyxyla              | 9773              | 7/29/2008 14:10  | 8.12                             | --                  | --                   | --                 | --                       | --                |
| yuyxyla              | 9893              | 8/25/2008 15:30  | 7.92                             | <0.9                | 18.0                 | 772.0              | 204.0                    | 48.30             |
| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L)   | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |                   |
| yuyxyla              | 9426              | 6/4/2008 15:30   | 997.9                            | 13.4                | <0.20                | 140.9              | 4                        |                   |
| yuyxyla              | 9469              | 6/24/2008 13:00  | 936.5                            | 8.00                | 0.30E                | 121.8              | 4                        |                   |
| yuyxyla              | 9478              | 7/1/2008 15:16   | 924.6                            | 7.40                | <0.20                | 121.5              | 4                        |                   |
| yuyxyla              | 9752              | 7/15/2008 12:53  | 886.3                            | 6.50                | <0.20                | 131.1              | 4                        |                   |
| yuyxyla              | 9773              | 7/29/2008 14:10  | --                               | 22.6                | <0.20                | 142.0              | --                       |                   |
| yuyxyla              | 9893              | 8/25/2008 15:30  | 829.6                            | 13.4                | <0.20                | 140.9              | 3                        |                   |

**Table 9.** Water quality, field measurements and laboratory analyses – Yukon River above Whitehorse, Canada.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| yuyxyla                 | 9426                 | 6/4/2008 15:30   | 0.060                         | 2.6  | 2.30                                  | --                         | 1,133                                   | 11.9             | -148.4               | -19.02                |
| yuyxyla                 | 9469                 | 6/24/2008 13:00  | 0.051                         | 2.5  | 2.10                                  | n/a                        | n/a                                     | n/a              | -147.7               | -18.88                |
| yuyxyla                 | 9478                 | 7/1/2008 15:16   | 0.041                         | 2.1  | 1.90                                  | n/a                        | n/a                                     | n/a              | -145.3               | -18.68                |
| yuyxyla                 | 9752                 | 7/15/2008 12:53  | --                            | --   | --                                    | --                         | --                                      | --               | -143.4               | -18.59                |
| yuyxyla                 | 9773                 | 7/29/2008 14:10  | --                            | --   | --                                    | n/a                        | n/a                                     | n/a              | -143.4               | -18.59                |
| yuyxyla                 | 9893                 | 8/25/2008 15:30  | 0.022                         | 2.9  | 2.60                                  | --                         | --                                      | --               | -146.2               | -17.70                |

**Table 10.** Water quality, field measurements, and laboratory analyses – Yukon River below Whitehorse, Canada.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yuyxy1b              | 9151              | 3/23/2007 11:07  | Under ice      | 1.00                  | 0.40                    | 11.6               | 7.22                               | 99.0                            |
| yuyxy1b              | 9425              | 6/4/2008 13:40   | Open water     | 21.0                  | 9.70                    | 11.4               | 7.94                               | 113                             |
| yuyxy1b              | 9443              | 6/20/2008 14:30  | Open water     | 17.0                  | 13.5                    | 10.5               | 7.88                               | 107                             |
| yuyxy1b              | 9475              | 6/30/2008 19:06  | Open water     | --                    | 13.1                    | 10.6               | 7.92                               | 105                             |
| yuyxy1b              | 9755              | 7/14/2008 10:10  | Open water     | 19.8                  | 15.0                    | --                 | 7.61                               | 102                             |
| yuyxy1b              | 9768              | 7/28/2008 15:30  | Open water     | 22.3                  | 13.6                    | 10.4               | 8.00                               | 100                             |
| yuyxy1b              | 9886              | 8/26/2008 10:44  | Open water     | 10.7                  | 12.8                    | 10.9               | 7.65                               | 98.2                            |

**Table 10.** Water quality, field measurements, and laboratory analyses – Yukon River below Whitehorse, Canada.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yuyxy1b              | 9151              | 3/23/2007 11:07  | 7.40                          | <0.9                | 16.6                 | 739.9              | 219.5                | 51.90             |
| yuyxy1b              | 9425              | 6/4/2008 13:40   | 7.78                          | <0.9                | 14.4                 | 924.0              | 298.4                | 131.1             |
| yuyxy1b              | 9443              | 6/20/2008 14:30  | 7.94                          | <0.9                | 11.5                 | 834.2              | 272.9                | 106.7             |
| yuyxy1b              | 9475              | 6/30/2008 19:06  | 7.63                          | <0.9                | 15.6                 | 841.5              | 271.3                | 53.70             |
| yuyxy1b              | 9755              | 7/14/2008 10:10  | --                            | 1.9E                | 24.7                 | 834.1              | 235.7                | 76.30             |
| yuyxy1b              | 9768              | 7/28/2008 15:30  | 8.15                          | 3.2E                | 16.9                 | 826.7              | 223.9                | 49.20             |
| yuyxy1b              | 9886              | 8/26/2008 10:44  | 7.70                          | <0.9                | 22.3                 | 811.0              | 216.4                | 56.60             |

**Table 10.** Water quality, field measurements, and laboratory analyses – Yukon River below Whitehorse, Canada.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| yuyxy1b              | 9151              | 3/23/2007 11:07  | 851.3                            | 8.20                | 3.10               | 152.9              | 1                        |
| yuyxy1b              | 9425              | 6/4/2008 13:40   | 1,113.6                          | 13.8                | <0.20              | 144.8              | 3                        |
| yuyxy1b              | 9443              | 6/20/2008 14:30  | 982.0                            | 11.6                | 1.20E              | 126.3              | 4                        |
| yuyxy1b              | 9475              | 6/30/2008 19:06  | 949.9                            | 10.7                | 0.20E              | 91.80              | 6                        |
| yuyxy1b              | 9755              | 7/14/2008 10:10  | 924.8                            | 12.1                | <0.20              | 136.2              | 4                        |
| yuyxy1b              | 9768              | 7/28/2008 15:30  | 895.4                            | 10.9                | 0.30E              | 133.0              | 4                        |
| yuyxy1b              | 9886              | 8/26/2008 10:44  | 858.8                            | 9.20                | <0.20              | 178.7              | 3                        |

**Table 10.** Water quality, field measurements, and laboratory analyses – Yukon River below Whitehorse, Canada.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| yuyxy1b                 | 9151                 | 3/23/2007 11:07  | 0.022                         | 1.7  | 1.30                                  | 649                        | 1,066                                   | 6.6              | -142.8             | -18.56                |
| yuyxy1b                 | 9425                 | 6/4/2008 13:40   | 0.074                         | 2.9  | 2.60                                  | 419                        | 1,234                                   | 8.3              | -148.9             | -19.06                |
| yuyxy1b                 | 9443                 | 6/20/2008 14:30  | 0.046                         | 1.2  | 3.70                                  | n/a                        | n/a                                     | n/a              | -142.8             | -18.8                 |
| yuyxy1b                 | 9475                 | 6/30/2008 19:06  | 0.044                         | 2.3  | 2.00                                  | n/a                        | n/a                                     | n/a              | -146.2             | -18.8                 |
| yuyxy1b                 | 9755                 | 7/14/2008 10:10  | 0.030                         | 1.9  | 1.60                                  | n/a                        | n/a                                     | n/a              | -145.5             | -18.56                |
| yuyxy1b                 | 9768                 | 7/28/2008 15:30  | 0.040                         | 1.0  | 3.90                                  | n/a                        | n/a                                     | n/a              | -144.7             | -18.48                |
| yuyxy1b                 | 9886                 | 8/26/2008 10:44  | 0.025                         | 1.8  | 1.40                                  | --                         | --                                      | 7.70             | -145.2             | -18.50                |

**Table 11.** Water quality, field measurements, and laboratory analyses – Yukon River at Carmacks, Canada.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million; δ <sup>2</sup> D, deuterium; δ <sup>18</sup> O, oxygen-18; E, Estimated; n/a, not available, no sample collected, Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yucex1a              | 9427              | 6/3/2008 17:36   | Open water     | 14.0                  | 8.70                    | 11.5               | 7.99                               | 142                             |
| yucex1a              | 9444              | 6/20/2008 12:00  | Open water     | 16.0                  | 11.2                    | 10.8               | 7.87                               | 137                             |
| yucex1a              | 9471              | 6/30/2008 14:45  | Open water     | 20.9                  | 11.1                    | 10.9               | 7.95                               | 133                             |
| yucex1a              | 9756              | 7/14/2008 12:00  | Open water     | 20.9                  | 12.9                    | --                 | 7.76                               | 131                             |
| yucex1a              | 9767              | 7/28/2008 11:20  | Open water     | --                    | 12.2                    | 10.3               | 7.84                               | 137                             |

**Table 11.** Water quality, field measurements, and laboratory analyses – Yukon River at Carmacks, Canada.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units)    | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L)     | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|----------------------|--------------------|--------------------------|-------------------|
| yucex1a              | 9427              | 6/3/2008 17:36   | 7.93                             | <0.9                | 16.5                 | 1,095              | 430.9                    | 98.40             |
| yucex1a              | 9444              | 6/20/2008 12:00  | 7.36                             | <0.9                | 10.6                 | 1,035              | 415.6                    | 154.5             |
| yucex1a              | 9471              | 6/30/2008 14:45  | 7.61                             | <0.9                | 17.1                 | 1,009              | 409.3                    | 60.70             |
| yucex1a              | 9756              | 7/14/2008 12:00  | 6.30                             | 1.3E                | 19.3                 | 1,024              | 372.0                    | 74.80             |
| yucex1a              | 9767              | 7/28/2008 11:20  | 7.96                             | 3.2E                | 12.7                 | 800.1              | 218.7                    | 84.50             |
| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L)   | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |                   |
| yucex1a              | 9427              | 6/3/2008 17:36   | 1,309                            | 8.20                | 22.9                 | 194.7              | 3                        |                   |
| yucex1a              | 9444              | 6/20/2008 12:00  | 1,299                            | 17.3                | 1.20                 | 124.6              | 2                        |                   |
| yucex1a              | 9471              | 6/30/2008 14:45  | 1,187                            | 9.50                | 0.80E                | 173.2              | 2                        |                   |
| yucex1a              | 9756              | 7/14/2008 12:00  | 1,203                            | 10.7                | 1.10E                | 174.5              | 4                        |                   |
| yucex1a              | 9767              | 7/28/2008 11:20  | 876.5                            | 14.7                | 1.30E                | 211.8              | 1                        |                   |

**Table 11.** Water quality, field measurements, and laboratory analyses – Yukon River at Carmacks, Canada.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| yucex1a                 | 9427                 | 6/3/2008 17:36   | 0.120                         | 3.1  | 3.90                                  | 497                        | 1,520                                   | 6.9              | -158.7               | -20.27                |
| yucex1a                 | 9444                 | 6/20/2008 12:00  | 0.125                         | 3.1  | 4.00                                  | --                         | --                                      | --               | -159.9               | -20.65                |
| yucex1a                 | 9471                 | 6/30/2008 14:45  | 0.108                         | 2.9  | 3.80                                  | n/a                        | n/a                                     | n/a              | -159.3               | -20.30                |
| yucex1a                 | 9756                 | 7/14/2008 12:00  | 0.104                         | 2.8  | 3.70                                  | n/a                        | n/a                                     | n/a              | -157.8               | -20.17                |
| yucex1a                 | 9767                 | 7/28/2008 11:20  | 0.088                         | 2.6  | 3.40                                  | n/a                        | n/a                                     | n/a              | -156.4               | -19.94                |

**Table 12.** Water quality, field measurements, and laboratory analyses – White River, Canada.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million; δ<sup>2</sup>D, deuterium; δ<sup>18</sup>O, oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control, quality assurance for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type                | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|-------------------------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| whyda1b              | 9718              | 7/3/2008 11:47   | Open water                    | 22.0                  | 13.7                    | 9.86               | 8.23                               | 248                             |
| whyda1b              | 9841              | 8/6/2008 12:17   | Open water                    | 14.0                  | 11.9                    | 9.85               | 8.51                               | 259                             |
| whyda1b              | 9842              | 8/6/2008 12:17   | Open water                    | 14.0                  | 11.9                    | 9.85               | 7.66                               | 259                             |
| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L)   | Potassium<br>(µeq/L)    | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L)               | Sodium<br>(µeq/L)               |
| whyda1b              | 9718              | 7/3/2008 11:47   | 8.29                          | <0.9                  | 42.3                    | 1,907              | 691.5                              | 404.0                           |
| whyda1b              | 9841              | 8/6/2008 12:17   | 8.30                          | --                    | --                      | --                 | --                                 | --                              |
| whyda1b              | 9842              | 8/6/2008 12:17   | 8.30                          | --                    | --                      | --                 | --                                 | --                              |

**Table 12.** Water quality, field measurements and laboratory analyses – White River, Canada.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) |  | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |  |
|----------------------|-------------------|------------------|----------------------------------|--|---------------------|--------------------|--------------------|--------------------------|--|
| whyda1b              | 9718              | 7/3/2008 11:47   | 2,005                            |  | 32.6                | 3.4                | 923                | 1                        |  |
| whyda1b              | 9841              | 8/6/2008 12:17   | 1,899                            |  | --                  | --                 | --                 | --                       |  |
| whyda1b              | 9842              | 8/6/2008 12:17   | 1,777                            |  | --                  | --                 | --                 | --                       |  |

  

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | δ <sup>2</sup> D | δ <sup>18</sup> O |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|------------------|-------------------|
| whyda1b                 | 9718                 | 7/3/2008 11:47   | 0.106                         | 2.2  | 4.90                                  | n/a                        | n/a                                     | n/a              | -180.1           | -23.09            |
| whyda1b                 | 9841                 | 8/6/2008 12:17   | 0.133                         | 3.8  | 3.50                                  | 607                        | 1,992                                   | 5.6              | -185.8           | -23.90            |
| whyda1b                 | 9842                 | 8/6/2008 12:17   | 0.114                         | 3.2  | 3.60                                  | n/a                        | n/a                                     | n/a              | -184.9           | -23.2             |

**Table 13.** Water quality, field measurements, and laboratory analyses – Stewart River, Canada.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million; δ <sup>2</sup> D, deuterium; δ <sup>18</sup> O, oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| stymala              | 9470              | 6/24/2008 15:16  | Open water     | 22.5                  | 15.2                    | 10.5               | 8.24                               | 220                             |
| stymala              | 9750              | 7/8/2008 10:10   | Open water     | 16.0                  | 14.4                    | 10.1               | 8.11                               | 239                             |
| stymala              | 9769              | 7/22/2008 9:45   | Open water     | 17.5                  | 12.1                    | 10.6               | 8.05                               | 209                             |
| stymala              | 9860              | 8/19/2008 13:40  | Open water     | 13.2                  | 11.4                    | 11.1               | 8.05                               | 230                             |
| stymala              | 9871              | 9/2/2008 14:00   | Open water     | --                    | 6.90                    | 12.6               | --                                 | 335                             |

**Table 13.** Water quality, field measurements and laboratory analyses – Stewart River, Canada.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units)    | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L)     | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|----------------------|--------------------|--------------------------|-------------------|
| stymala              | 9470              | 6/24/2008 15:16  | 8.04                             | <0.9                | 11.3                 | 1,912              | 1,128                    | 73.80             |
| stymala              | 9750              | 7/8/2008 10:10   | 8.00                             | <0.9                | 7.80                 | 1,877              | 1,112                    | 157.3             |
| stymala              | 9769              | 7/22/2008 9:45   | 7.90                             | 3.7E                | 5.40                 | 1,988              | 1,165                    | 127.4             |
| stymala              | 9860              | 8/19/2008 13:40  | 8.18                             | <0.9                | 8.00                 | 2,157              | 1,281                    | 175.3             |
| stymala              | 9871              | 9/2/2008 14:00   | 8.03                             | <0.9                | 11.3                 | 2,151              | 1,275                    | 94.00             |
|                      |                   |                  |                                  |                     |                      |                    |                          |                   |
| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L)   | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |                   |
| stymala              | 9470              | 6/24/2008 15:16  | 1,378                            | 9.40                | 3.70                 | 1,711              | 0                        |                   |
| stymala              | 9750              | 7/8/2008 10:10   | 1,583                            | 26.9                | 1.90                 | 1,700              | -2                       |                   |
| stymala              | 9769              | 7/22/2008 9:45   | 1,620                            | 36.5                | 2.80                 | 1,755              | 0                        |                   |
| stymala              | 9860              | 8/19/2008 13:40  | 1,838                            | 16.4                | 1.50E                | 1,554              | 3                        |                   |
| stymala              | 9871              | 9/2/2008 14:00   | --                               | 5.90                | 2.50                 | 1,594              | 4                        |                   |

**Table 13.** Water quality, field measurements and laboratory analyses – Stewart River, Canada.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| stymala                 | 9470                 | 6/24/2008 15:16  | 0.051                         | 2.8  | 1.80                                  | 488                        | 1,877                                   | 3.7              | -169.2               | -22.39                |
| stymala                 | 9750                 | 7/8/2008 10:10   | 0.065                         | 2.7  | 2.50                                  | n/a                        | n/a                                     | n/a              | -171.1               | -22.03                |
| stymala                 | 9769                 | 7/22/2008 9:45   | 0.080                         | 2.7  | 2.90                                  | n/a                        | n/a                                     | n/a              | -166.3               | -21.77                |
| stymala                 | 9860                 | 8/19/2008 13:40  | 0.075                         | 2.9  | 2.60                                  | n/a                        | n/a                                     | n/a              | -167.4               | -21.20                |
| stymala                 | 9871                 | 9/2/2008 14:00   | 0.114                         | 3.1  | 3.60                                  | --                         | 2,331                                   | 3.8              | -169.1               | -20.80                |

**Table 14.** Water quality, field measurements, and laboratory analyses – Yukon River at Dawson, Canada.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| yuydala              | 9063              | 5/30/2006 10:30  | Open water     | 17.5                                  | 9.90                                    | 9.15               | 7.66                               | --                                                  |
| yuydala              | 9086              | 6/28/2006 16:15  | Open water     | --                                    | --                                      | --                 | 7.65                               | --                                                  |
| yuydala              | 9102              | 7/12/2006 14:30  | Open water     | 26.0                                  | 16.6                                    | 9.74               | 7.47                               | 186                                                 |
| yuydala              | 9136              | 9/24/2006 14:00  | Open water     | 4.00                                  | 7.4                                     | 12.2               | 7.90                               | 231                                                 |
| yuydala              | 9208              | 6/18/2007 15:00  | Open water     | 23.0                                  | 14.2                                    | 9.63               | 8.12                               | 151                                                 |
| yuydala              | 9226              | 6/28/2007 16:00  | Open water     | 26.0                                  | 16.5                                    | --                 | 8.05                               | 198                                                 |
| yuydala              | 9267              | 8/7/2007 14:00   | Open water     | --                                    | 16.4                                    | --                 | 7.72                               | 201                                                 |
| yuydala              | 9476              | 6/18/2008 15:30  | Open water     | 17.9                                  | 13.6                                    | 191                | 8.29                               | 191                                                 |
| yuydala              | 9715              | 7/3/2008 16:30   | Open water     | 23.3                                  | 14.1                                    | --                 | --                                 | 189                                                 |

**Table 14.** Water quality, field measurements, and laboratory analyses – Yukon River at Dawson, Canada.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yuydala              | 9770              | 7/18/2008 16:30  | Open Water     | 15.6                  | 15.3                    | 9.20               | 7.79                               | 211                             |
| yuydala              | 9826              | 7/30/2008 16:00  | Open Water     | 19.9                  | 13.7                    | 10.8               | 8.51                               | 222                             |
| yuydala              | 9861              | 8/14/2008 14:00  | Open Water     | 23.0                  | 13.5                    | 10.4               | 7.94                               | 183                             |
| yuydala              | 9909              | 8/25/2008 10:30  | Open Water     | 12.2                  | 11.6                    | 10.5               | 8.33                               | 236                             |

**Table 14.** Water quality, field measurements, and laboratory analyses – Yukon River at Dawson, Canada.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yuydala              | 9063              | 5/30/2006 10:30  | 7.90                          | <0.9                | 20.6                 | 1,280              | 606.2                | 79.10             |
| yuydala              | 9086              | 6/28/2006 16:15  | --                            | <0.9                | 22.1                 | 1,417              | 689.2                | 92.00             |
| yuydala              | 9102              | 7/12/2006 14:30  | 7.66                          | <0.9                | 37.0                 | 1,446              | 684.4                | 125.3             |
| yuydala              | 9136              | 9/24/2006 14:00  | 7.74                          | <0.9                | 23.2                 | 1,639              | 803.6                | 108.4             |
| yuydala              | 9208              | 6/18/2007 15:00  | --                            | <0.9                | 22.6                 | 1,400              | 584.3                | 140.7             |
| yuydala              | 9226              | 6/28/2007 16:00  | 8.18                          | <0.9                | 35.1                 | 1,427              | 583.9                | 107.3             |
| yuydala              | 9267              | 8/7/2007 14:00   | 8.20                          | <0.9                | 26.9                 | 1,378              | 383.0                | 317.6             |
| yuydala              | 9476              | 6/18/2008 15:30  | 8.20                          | <0.9                | 16.8                 | 1,480              | 702.7                | 139.0             |
| yuydala              | 9715              | 7/3/2008 16:30   | 8.13                          | <0.9                | 21.7                 | 1,490              | 591.3                | 260.7             |
| yuydala              | 9770              | 7/18/2008 16:30  | 8.11                          | <0.9                | 26.3                 | 1,530              | 626.0                | 210.3             |
| yuydala              | 9826              | 7/30/2008 16:00  | 8.05                          | <0.9                | 21.1                 | 1,511              | 722.4                | 261.4             |
| yuydala              | 9861              | 8/14/2008 14:00  | 8.07                          | <0.9                | 29.9                 | 1,617              | 717.8                | 216.0             |
| yuydala              | 9909              | 8/25/2008 10:30  | 8.11                          | <0.9                | 30.0                 | 1,584              | 733.9                | 285.0             |

**Table 14.** Water quality, field measurements, and laboratory analyses – Yukon River at Dawson, Canada.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| yuydala              | 9063              | 5/30/2006 10:30  | 1,305                            | 11.3                | 3.30               | 516.4              | 4                        |
| yuydala              | 9086              | 6/28/2006 16:15  | 1,428                            | 8.50                | 3.10               | 641.5              | 4                        |
| yuydala              | 9102              | 7/12/2006 14:30  | 1,489                            | 11.6                | 2.40               | 648.3              | 3                        |
| yuydala              | 9136              | 9/24/2006 14:00  | 1,643                            | 14.4                | 2.60               | 794.2              | 2                        |
| yuydala              | 9208              | 6/18/2007 15:00  | 1,486                            | 21.9                | 3.00               | 578.3              | 2                        |
| yuydala              | 9226              | 6/28/2007 16:00  | 1,519                            | 16.0                | 1.10E              | 549.5              | 2                        |
| yuydala              | 9267              | 8/7/2007 14:00   | 1,589                            | 42.8                | 0.60E              | 651.6              | -4                       |
| yuydala              | 9476              | 6/18/2008 15:30  | 1,462                            | 34.1                | 3.00               | 718.0              | 3                        |
| yuydala              | 9715              | 7/3/2008 16:30   | --                               | 14.9                | 1.00               | 668.7              | --                       |
| yuydala              | 9770              | 7/18/2008 16:30  | 1,528                            | 47.9                | <0.20              | 769.1              | 1                        |
| yuydala              | 9826              | 7/30/2008 16:00  | 1,655                            | 30.1                | 3.20               | 1,037              | -4                       |
| yuydala              | 9861              | 8/14/2008 14:00  | 1,680                            | 19.8                | 0.40E              | 702.5              | -2                       |
| yuydala              | 9909              | 8/25/2008 10:30  | 1,677                            | 28.3                | 2.50               | 739.8              | 4                        |

**Table 14.** Water quality, field measurements, and laboratory analyses – Yukon River at Dawson, Canada.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| yuydala                 | 9063                 | 5/30/2006 10:30  | 0.281                         | 3.5  | 8.10                                  | 835                        | 1,428                                   | 2.8              | -166.6             | -21.54                |
| yuydala                 | 9086                 | 6/28/2006 16:15  | 0.124                         | 2.7  | 4.50                                  | 869                        | 1,677                                   | 2.8              | -163.1             | -21.11                |
| yuydala                 | 9102                 | 7/12/2006 14:30  | 0.090                         | 2.1  | 4.30                                  | 1,189                      | 1,834                                   | 3.2              | -165.3             | -21.37                |
| yuydala                 | 9136                 | 9/24/2006 14:00  | 0.064                         | 1.9  | 3.40                                  | 771                        | 1,486                                   | 2.3              | -159.1             | -20.38                |
| yuydala                 | 9208                 | 6/18/2007 15:00  | 0.129                         | 3.2  | 4.10                                  | 1,638                      | 1,708                                   | 3.47             | -166.5             | -21.45                |
| yuydala                 | 9226                 | 6/28/2007 16:00  | 0.085                         | 2.3  | 3.70                                  | 2,012                      | 1,690                                   | 3.21             | --                 | --                    |
| yuydala                 | 9267                 | 8/7/2007 14:00   | 0.094                         | 3.7  | 2.50                                  | 415                        | 1,666                                   | 3.3              | -165.1             | -21.24                |
| yuydala                 | 9476                 | 6/18/2008 15:30  | 0.060                         | 2.6  | 2.30                                  | 752                        | 1930                                    | 4.1              | -166.8             | -21.39                |
| yuydala                 | 9715                 | 7/3/2008 16:30   | 0.142                         | 2.3  | 6.20                                  | n/a                        | n/a                                     | n/a              | -165.4             | -21.36                |
| yuydala                 | 9770                 | 7/18/2008 16:30  | 0.122                         | 2.4  | 5.10                                  | n/a                        | n/a                                     | n/a              | -168.4             | -21.6                 |
| yuydala                 | 9826                 | 7/30/2008 16:00  | 0.112                         | 2.1  | 5.50                                  | 1,123                      | 1,732                                   | 5.7              | -163.4             | -21.18                |
| yuydala                 | 9861                 | 8/14/2008 14:00  | 0.120                         | 3.3  | 3.60                                  | --                         | 1,841                                   | 4.3              | -166.2             | -21.00                |
| yuydala                 | 9909                 | 8/25/2008 10:30  | 0.151                         | 2.4  | 6.30                                  | n/a                        | n/a                                     | n/a              | -166.7             | -20.20                |

**Table 15.** Water quality, field measurements, and laboratory analyses – Yukon River at Eagle, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yueaala              | 9040              | 5/11/2006 9:00   | Open water     | 8.90                  | 0.30                    | 12.0               | 7.14                               | 173                             |
| yueaala              | 9048              | 5/20/2006 13:00  | Open water     | 20.0                  | 10.0                    | 8.00               | 7.51                               | 83.0                            |
| yueaala              | 9073              | 6/14/2006 20:30  | Open water     | 20.0                  | 16.0                    | 9.00               | 7.68                               | 221                             |
| yueaala              | 9098              | 7/10/2006 15:00  | Open water     | 27.6                  | 17.2                    | 9.00               | 7.58                               | 227                             |
| yueaala              | 9121              | 9/12/2006 16:10  | Open water     | 14.0                  | 11.4                    | 9.00               | 7.91                               | 251                             |
| yueaala              | 9135              | 10/2/2006 15:10  | Open water     | 9.70                  | 6.50                    | 8.50               | 7.97                               | 258                             |
| yueaala              | 9156              | 4/7/2007 14:25   | Under ice      | 11.0                  | 0.13                    | 9.00               | 8.07                               | 224                             |
| yueaala              | 9167              | 5/16/2007 16:00  | Open water     | 12.5                  | 7.80                    | 11.0               | 7.90                               | 177                             |
| yueaala              | 9187              | 5/30/2007 17:00  | Open water     | 16.6                  | 11.3                    | --                 | 7.84                               | 173                             |
| yueaala              | 9202              | 6/16/2007 15:45  | Open water     | 19.8                  | 14.1                    | --                 | 8.05                               | 200                             |
| yueaala              | 9224              | 7/3/2007 15:40   | Open water     | 19.7                  | 16.8                    | --                 | 8.67                               | 218                             |

**Table 15.** Water quality, field measurements, and laboratory analyses – Yukon River at Eagle, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yueaala              | 9239              | 7/19/2007 15:20  | Open water     | 20.5                  | 17.9                    | --                 | 7.68                               | 219                             |
| yueaala              | 9261              | 8/1/2007 17:06   | Open water     | 19.8                  | 17.2                    | --                 | 7.90                               | 221                             |
| yueaala              | 9276              | 8/20/2007 15:52  | Open water     | 16.3                  | 16.2                    | --                 | 7.76                               | 226                             |
| yueaala              | 9400              | 4/15/2008 14:45  | Under ice      | 2.10                  | 0.70                    | 10.5               | 8.33                               | 272                             |
| yueaala              | 9434              | 6/11/2008 14:55  | Open water     | 17.5                  | 14.1                    | 9.00               | 7.99                               | 170                             |
| yueaala              | 9460              | 6/25/2008 16:00  | Open water     | 19.3                  | 15.5                    | 9.00               | 8.02                               | 210                             |
| yueaala              | 9690              | 7/8/2008 15:05   | Open water     | 16.7                  | 15.2                    | 9.00               | 8.08                               | 206                             |
| yueaala              | 9758              | 7/19/2008 15:00  | Open water     | 14.5                  | 14.7                    | 10.0               | 8.68                               | 214                             |
| yueaala              | 9837              | 8/4/2008 15:35   | Open water     | 14.6                  | 13.4                    | 10.0               | 7.98                               | 228                             |
| yueaala              | 9838              | 8/4/2008 18:20   | Open water     | 14.8                  | 13.5                    | 10.0               | 8.23                               | 228                             |
| yueaala              | 9873              | 9/1/2008 12:10   | Open water     | 16.8                  | 9.3                     | 9.00               | 8.17                               | 213                             |
| yueaala              | 9915              | 8/18/2008 16:25  | Open water     | 14.0                  | 13.2                    | 10.0               | 8.22                               | 235                             |

**Table 15.** Water quality, field measurements, and laboratory analyses – Yukon River at Eagle, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yueaala              | 9040              | 5/11/2006 9:00   | 7.88                          | --                  | --                   | --                 | --                   | --                |
| yueaala              | 9048              | 5/20/2006 13:00  | 7.48                          | <0.9                | 17.8                 | 1,093              | 609.7                | 135.7             |
| yueaala              | 9073              | 6/14/2006 20:30  | 8.04                          | <0.9                | 19.9                 | 1,459              | 735.6                | 89.10             |
| yueaala              | 9098              | 7/10/2006 15:00  | 7.95                          | <0.9                | 35.7                 | 1,475              | 711.6                | 110.3             |
| yueaala              | 9121              | 9/12/2006 16:10  | 7.72                          | <0.9                | 23.2                 | 1,678              | 854.8                | 115.5             |
| yueaala              | 9135              | 10/2/2006 15:10  | 7.80                          | <0.9                | 22.0                 | 1,702              | 868.1                | 118.1             |
| yueaala              | 9156              | 4/7/2007 14:25   | 7.81                          | <0.9                | 25.5                 | 1,776              | 781.1                | 116.8             |
| yueaala              | 9167              | 5/16/2007 16:00  | 7.61                          | <0.9                | 30.6                 | 1,268              | 524.1                | 89.40             |
| yueaala              | 9187              | 5/30/2007 17:00  | 8.12                          | <0.9                | 22.9                 | 1,193              | 408.4                | 119.2             |
| yueaala              | 9202              | 6/16/2007 15:45  | 7.99                          | <0.9                | 20.7                 | 1,379              | 583.8                | 128.7             |
| yueaala              | 9224              | 7/3/2007 15:40   | 8.05                          | <0.9                | 20.8                 | 1,398              | 612.1                | 287.4             |

**Table 15.** Water quality, field measurements, and laboratory analyses – Yukon River at Eagle, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yueaala              | 9239              | 7/19/2007 15:20  | 7.95                          | <0.9                | 23.5                 | 1,476              | 579.5                | 159.8             |
| yueaala              | 9261              | 8/1/2007 17:06   | 8.22                          | <0.9                | 19.5                 | 1,352              | 358.7                | 353.0             |
| yueaala              | 9276              | 8/20/2007 15:52  | 8.08                          | <0.9                | 30.5                 | 1,519              | 555.7                | 388.6             |
| yueaala              | 9400              | 4/15/2008 14:45  | 7.09                          | 5.8                 | 32.1                 | 1,714              | 713.6                | 126.6             |
| yueaala              | 9434              | 6/11/2008 14:55  | 8.13                          | <0.9                | 22.6                 | 1,431              | 694.8                | 101.9             |
| yueaala              | 9460              | 6/25/2008 16:00  | 8.25                          | <0.9                | 17.1                 | 1,468              | 716.5                | 197.6             |
| yueaala              | 9690              | 7/8/2008 15:05   | 8.22                          | <0.9                | 18.9                 | 1,505              | 590.1                | 209.8             |
| yueaala              | 9758              | 7/19/2008 15:00  | 8.20                          | <0.9                | 19.6                 | 1,552              | 675.6                | 332.4             |
| yueaala              | 9837              | 8/4/2008 15:35   | 8.30                          | <0.9                | 19.5                 | 1,559              | 717.6                | 221.5             |
| yueaala              | 9838              | 8/4/2008 18:20   | 8.32                          | <0.9                | 19.2                 | 1,565              | 722.8                | 227.1             |
| yueaala              | 9873              | 9/1/2008 12:10   | 8.13                          | <0.9                | 23.6                 | 1,523              | 689.8                | 226.0             |
| yueaala              | 9915              | 8/18/2008 16:25  | 8.19                          | <0.9                | 24.7                 | 1,613              | 773.1                | 221.2             |

**Table 15.** Water quality, field measurements, and laboratory analyses – Yukon River at Eagle, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>( $\mu\text{eq/L}$ ) | Chloride<br>( $\mu\text{eq/L}$ ) | Nitrate<br>( $\mu\text{eq/L}$ ) | Sulfate<br>( $\mu\text{eq/L}$ ) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|-----------------------------------------------|----------------------------------|---------------------------------|---------------------------------|--------------------------|
| yueaala              | 9040              | 5/11/2006 9:00   | 1,184                                         | 20.3                             | 5.40                            | 472.4                           | --                       |
| yueaala              | 9048              | 5/20/2006 13:00  | 1,197                                         | 33.4                             | 4.30                            | 414.1                           | 6                        |
| yueaala              | 9073              | 6/14/2006 20:30  | 1,477                                         | 14.0                             | 4.20                            | 684.3                           | 3                        |
| yueaala              | 9098              | 7/10/2006 15:00  | 1,465                                         | 11.3                             | 5.50                            | 704.5                           | 3                        |
| yueaala              | 9121              | 9/12/2006 16:10  | 1,626                                         | 16.5                             | 2.90                            | 886.5                           | 3                        |
| yueaala              | 9135              | 10/2/2006 15:10  | 1,677                                         | 16.9                             | 4.10                            | 866.7                           | 3                        |
| yueaala              | 9156              | 4/7/2007 14:25   | 1,909                                         | 17.5                             | 6.50                            | 788.3                           | 0                        |
| yueaala              | 9167              | 5/16/2007 16:00  | 1,244                                         | 13.2                             | 0.90E                           | 491.9                           | 4                        |
| yueaala              | 9187              | 5/30/2007 17:00  | 1,235                                         | 31.9                             | 1.30E                           | 465.0                           | 0                        |
| yueaala              | 9202              | 6/16/2007 15:45  | 1,406                                         | 30.9                             | 2.50                            | 603.4                           | 2                        |
| yueaala              | 9224              | 7/3/2007 15:40   | 1,570                                         | 41.2                             | 1.70                            | 686.1                           | 0                        |

**Table 15.** Water quality, field measurements, and laboratory analyses – Yukon River at Eagle, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>( $\mu\text{eq/L}$ ) | Chloride<br>( $\mu\text{eq/L}$ ) | Nitrate<br>( $\mu\text{eq/L}$ ) | Sulfate<br>( $\mu\text{eq/L}$ ) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|-----------------------------------------------|----------------------------------|---------------------------------|---------------------------------|--------------------------|
| yueaala              | 9239              | 7/19/2007 15:20  | 1,437                                         | 39.1                             | 1.50E                           | 688.4                           | 2                        |
| yueaala              | 9261              | 8/1/2007 17:06   | 1,594                                         | 44.7                             | 0.90E                           | 700.5                           | -6                       |
| yueaala              | 9276              | 8/20/2007 15:52  | 1,675                                         | 46.1                             | 1.80                            | 699.0                           | 1                        |
| yueaala              | 9400              | 4/15/2008 14:45  | 1,995                                         | 23.0                             | 5.30                            | 669.1                           | -2                       |
| yueaala              | 9434              | 6/11/2008 14:55  | 1,477                                         | 12.6                             | 22.8                            | 656.8                           | 2                        |
| yueaala              | 9460              | 6/25/2008 16:00  | 1,480                                         | 53.7                             | 2.40                            | 762.5                           | 2                        |
| yueaala              | 9690              | 7/8/2008 15:05   | 1,497                                         | 13.7                             | 5.70                            | 744.3                           | 1                        |
| yueaala              | 9758              | 7/19/2008 15:00  | 1,606                                         | 55.1                             | 4.90                            | 803.3                           | 2                        |
| yueaala              | 9837              | 8/4/2008 15:35   | 1,663                                         | 28.2                             | 2.30                            | 694.5                           | 3                        |
| yueaala              | 9838              | 8/4/2008 18:20   | 1,657                                         | 32.1                             | 2.30                            | 693.0                           | 3                        |
| yueaala              | 9873              | 9/1/2008 12:10   | 1,535                                         | 28.5                             | <0.20                           | 685.2                           | 5                        |
| yueaala              | 9915              | 8/18/2008 16:25  | 1,662                                         | 28.9                             | 3.10                            | 755.0                           | 4                        |

**Table 15.** Water quality, field measurements, and laboratory analyses – Yukon River at Eagle, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| yueaala                 | 9040                 | 5/11/2006 9:00   | 0.556                         | 3.2  | 17.1                                  | 1,474                      | 1,358                                   | 4.4              | -170.0             | -21.53                |
| yueaala                 | 9048                 | 5/20/2006 13:00  | 0.675                         | 3.5  | 19.4                                  | 2,238                      | 1,351                                   | 2.2              | -172.4             | -22.13                |
| yueaala                 | 9073                 | 6/14/2006 20:30  | 0.109                         | 2.9  | 3.80                                  | 929                        | 1,720                                   | 2.1              | -164.0             | -21.10                |
| yueaala                 | 9098                 | 7/10/2006 15:00  | 0.088                         | 2.3  | 3.80                                  | 1,552                      | 1,793                                   | 2.8              | -164.7             | -21.25                |
| yueaala                 | 9121                 | 9/12/2006 16:10  | 0.083                         | 1.8  | 4.60                                  | 969                        | 1,910                                   | 2.7              | -160.5             | -20.64                |
| yueaala                 | 9135                 | 10/2/2006 15:10  | 0.086                         | 2.5  | 3.40                                  | 1,335                      | 1,988                                   | 3.1              | -159.7             | -20.49                |
| yueaala                 | 9156                 | 4/7/2007 14:25   | 0.021                         | 1.8  | 1.20                                  | 2,077                      | 2,263                                   | 3.2              | -159.1             | -20.30                |
| yueaala                 | 9167                 | 5/16/2007 16:00  | 0.329                         | 3.7  | 9.00                                  | 1,368                      | 2,007                                   | 5.1              | -174.1             | -22.33                |
| yueaala                 | 9187                 | 5/30/2007 17:00  | 0.374                         | 3.7  | 10.3                                  | 907                        | 2,002                                   | 3.6              | -172.7             | -22.19                |
| yueaala                 | 9202                 | 6/16/2007 15:45  | 0.158                         | 2.7  | 5.80                                  | 1,179                      | 2,175                                   | 2.4              | -166.2             | -21.37                |
| yueaala                 | 9224                 | 7/3/2007 15:40   | 0.106                         | 3.0  | 3.60                                  | 254                        | 1,590                                   | 3.1              | -165.7             | -21.45                |

**Table 15.** Water quality, field measurements, and laboratory analyses – Yukon River at Eagle, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| yueaala                 | 9239                 | 7/19/2007 15:20  | 0.126                         | 3.6  | 3.50                                  | 533                        | 1,631                                   | 2.7              | -164.4               | -21.19                |
| yueaala                 | 9261                 | 8/1/2007 17:06   | 0.119                         | 3.8  | 3.20                                  | 669                        | 1,669                                   | 2.9              | -164.0               | -21.11                |
| yueaala                 | 9276                 | 8/20/2007 15:52  | 0.085                         | 2.9  | 2.90                                  | 564                        | 1,752                                   | 2.8              | -161.3               | -20.96                |
| yueaala                 | 9400                 | 4/15/2008 14:45  | 0.040                         | 1.8  | 2.20                                  | 882                        | 2,426                                   | 18.1             | -160.6               | -20.62                |
| yueaala                 | 9434                 | 6/11/2008 14:55  | 0.133                         | 3.2  | 4.20                                  | 411                        | 1,954                                   | 3.3              | -166.7               | -21.30                |
| yueaala                 | 9460                 | 6/25/2008 16:00  | 0.136                         | 2.4  | 5.80                                  | 1,084                      | 1,877                                   | 7.9              | -167.3               | -21.56                |
| yueaala                 | 9690                 | 7/8/2008 15:05   | 0.164                         | 3.5  | 4.70                                  | --                         | 1,866                                   | 5.0              | -166.8               | -21.35                |
| yueaala                 | 9758                 | 7/19/2008 15:00  | 0.161                         | 3.5  | 4.70                                  | 172                        | 1,927                                   | 2.2              | -167.2               | -21.46                |
| yueaala                 | 9837                 | 8/4/2008 15:35   | 0.148                         | 3.1  | 4.80                                  | 706                        | 1,709                                   | 5.9              | -164.6               | -21.17                |
| yueaala                 | 9838                 | 8/4/2008 18:20   | 0.160                         | 3.5  | 4.60                                  | 226                        | 1,730                                   | 8.1              | -165.6               | -21.19                |
| yueaala                 | 9873                 | 9/1/2008 12:10   | 0.307                         | 3.6  | 8.50                                  | 476                        | 1,681                                   | 7.6              | -168.8               | -21.00                |
| yueaala                 | 9915                 | 8/18/2008 16:25  | 0.156                         | 3.5  | 4.50                                  | 742                        | 2,222                                   | 4.1              | -167.0               | -21.20                |

**Table 16.** Water quality, field measurements, and laboratory analyses – Yukon River at Circle, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yucr1a               | 9012              | 4/12/2006 15:15  | Under ice      | -1.00                 | 0.40                    | 13.23              | 7.46                               | 32.6                            |
| yucr1a               | 9047              | 5/17/2006 12:00  | Open water     | 10.0                  | 1.70                    | 13.15              | 7.43                               | 77.5                            |
| yucr1a               | 9051              | 5/23/2006 12:45  | Open water     | 14.0                  | 8.50                    | 12.01              | 7.50                               | 144                             |
| yucr1a               | 9074              | 6/14/2006 13:00  | Open water     | 23.8                  | 15.7                    | 9.64               | 7.65                               | 171                             |
| yucr1a               | 9141              | 10/10/2006 12:30 | Open water     | 11.3                  | 5.90                    | 11.16              | 7.75                               | 153                             |
| yucr1a               | 9214              | 6/28/2007 21:06  | Open water     | 24.3                  | 16.7                    | 9.60               | 8.24                               | 187                             |

**Table 16.** Water quality, field measurements, and laboratory analyses – Yukon River at Circle, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yucrcla              | 9012              | 4/12/2006 15:15  | 7.88                          | --                  | --                   | --                 | --                   | --                |
| yucrcla              | 9047              | 5/17/2006 12:00  | 7.48                          | <0.9                | 17.8                 | 1,093              | 609.7                | 135.7             |
| yucrcla              | 9051              | 5/23/2006 12:45  | 8.04                          | <0.9                | 19.9                 | 1,459              | 735.6                | 89.10             |
| yucrcla              | 9074              | 6/14/2006 13:00  | 7.95                          | <0.9                | 35.7                 | 1,475              | 711.6                | 110.3             |
| yucrcla              | 9141              | 10/10/2006 12:30 | 7.72                          | <0.9                | 23.2                 | 1,678              | 854.8                | 115.5             |
| yucrcla              | 9214              | 6/28/2007 21:06  | 7.80                          | <0.9                | 22.0                 | 1,702              | 868.1                | 118.1             |

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| yucrcla              | 9012              | 4/12/2006 15:15  | 2,231                            | 11.3                | 3.30               | 516.4              | --                       |
| yucrcla              | 9047              | 5/17/2006 12:00  | 1,058                            | 8.50                | 3.10               | 641.5              | 7                        |
| yucrcla              | 9051              | 5/23/2006 12:45  | 1,050                            | 11.6                | 2.40               | 648.3              | 7                        |
| yucrcla              | 9074              | 6/14/2006 13:00  | 1,438                            | 14.4                | 2.60               | 794.2              | 3                        |
| yucrcla              | 9141              | 10/10/2006 12:30 | 1,639                            | 21.9                | 3.00               | 578.3              | 3                        |
| yucrcla              | 9214              | 6/28/2007 21:06  | 1,583                            | 16.0                | 1.10E              | 549.5              | 1                        |

**Table 16.** Water quality, field measurements, and laboratory analyses – Yukon River at Circle, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| yucrcla                 | 9012                 | 4/12/2006 15:15  | 0.040                         | 2.1  | 2.00                                  | 1,848                      | 2,763                                   | 3.4              | -161.1               | -20.52                |
| yucrcla                 | 9047                 | 5/17/2006 12:00  | 0.694                         | 3.5  | 19.9                                  | 1,563                      | 1,185                                   | 6.1              | -172.9               | -22.17                |
| yucrcla                 | 9051                 | 5/23/2006 12:45  | 0.606                         | 3.6  | 17.0                                  | --                         | 1,195                                   | 2.4              | -173.1               | -22.23                |
| yucrcla                 | 9074                 | 6/14/2006 13:00  | 0.121                         | 2.7  | 4.50                                  | 944                        | 1,954                                   | 2.5              | -164.4               | -21.12                |
| yucrcla                 | 9141                 | 10/10/2006 12:30 | 0.090                         | 2.3  | 4.00                                  | 880                        | 1,979                                   | n/a              | -160.2               | -20.44                |
| yucrcla                 | 9214                 | 6/28/2007 21:06  | 0.322                         | 3.7  | 8.80                                  | 1,156                      | 1,583                                   | 3.3              | -165.6               | -22.31                |

**Table 17.** Water quality, field measurements, and laboratory analyses – Tanana River at Nenana, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| tanen1a              | 9010              | 3/23/2006 11:50  | Under ice      | 23.0                  | -0.03                   | 9.46               | 7.93                               | 324                             |
| tanen1a              | 9041              | 5/12/2006 16:40  | Open water     | 12.6                  | 5.07                    | 13.6               | 7.21                               | 226                             |
| tanen1a              | 9056              | 5/24/2006 11:00  | Open water     | 17.3                  | 10.1                    | 11.4               | 7.69                               | 197                             |
| tanen1a              | 9071              | 6/8/2006 16:00   | Open water     | 20.0                  | 11.9                    | 10.7               | 7.85                               | 291                             |
| tanen1a              | 9107              | 7/18/2006 --     | Open water     | 16.6                  | 14.1                    | --                 | 7.60                               | 253                             |
| tanen1a              | 9137              | 10/3/2006 11:00  | Open water     | 5.60                  | 2.92                    | --                 | --                                 | 318                             |
| tanen1a              | 9154              | 3/30/2007 13:13  | Under ice      | 11.6                  | 0.00                    | 9.00               | 8.14                               | 171                             |
| tanen1a              | 9155              | 3/30/2007 13:30  | Under ice      | 11.0                  | -0.03                   | 12.0               | --                                 | 327                             |
| tanen1a              | 9171              | 5/22/2007 21:10  | Open water     | --                    | 12.6                    | --                 | 7.92                               | 208                             |
| tanen1a              | 9200              | 6/8/2007 13:30   | Open water     | --                    | 13.0                    | 6.65               | 8.01                               | 190                             |
| tanen1a              | 9207              | 6/21/2007 14:45  | Open water     | 25.0                  | 18.2                    | 9.70               | 8.27                               | 217                             |

**Table 17.** Water quality, field measurements, and laboratory analyses – Tanana River at Nenana, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| tanen1a              | 9219              | 7/5/2007 18:05   | Open water     | --                    | 17.9                    | --                 | 8.20                               | 206                             |
| tanen1a              | 9238              | 7/20/2007 20:00  | Open water     | 23.8                  | 17.5                    | 9.39               | 7.53                               | 206                             |
| tanen1a              | 9241              | 7/20/2007 20:00  | Open water     | 23.9                  | 17.5                    | 9.39               | 7.66                               | 206                             |
| tanen1a              | 9263              | 8/6/2007 14:00   | Open water     | 14.6                  | 14.5                    | --                 | 7.64                               | 193                             |
| tanen1a              | 9275              | 8/20/2007 12:03  | Open water     | 18.9                  | 15.2                    | --                 | 7.36                               | 237                             |
| tanen1a              | 9396              | 4/14/2008 16:04  | Under ice      | 2.80                  | -0.04                   | 10.2               | 8.01                               | 295                             |
| tanen1a              | 9397              | 3/27/2008 14:09  | Under ice      | -1.90                 | 0.00                    | --                 | 8.52                               | 171                             |
| tanen1a              | 9420              | 6/2/2008 14:02   | Open water     | 26.5                  | 13.1                    | 10.4               | 8.46                               | 266                             |
| tanen1a              | 9432              | 6/16/2008 12:14  | Open water     | 23.5                  | 15.6                    | 9.91               | 8.09                               | 258                             |
| tanen1a              | 9454              | 6/30/2008 11:24  | Open water     | --                    | 12.3                    | 11.5               | 8.04                               | 170                             |
| tanen1a              | 9695              | 7/14/2008 12:30  | Open water     | 21.3                  | 14.9                    | 10.1               | 8.03                               | 243                             |
| tanen1a              | 9781              | 7/28/2008 12:40  | Open water     | 16.2                  | 13.2                    | 10.8               | 8.11                               | 251                             |
| tanen1a              | 9869              | 9/8/2008 11:45   | Open water     | 11.2                  | 10.6                    | 11.7               | 8.09                               | 296                             |
| tanen1a              | 9881              | 8/25/2008 11:50  | Open water     | 13.2                  | 11.0                    | 11.1               | 7.97                               | 271                             |

**Table 17.** Water quality, field measurements, and laboratory analyses – Tanana River at Nenana, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| tanen1a              | 9010              | 3/23/2006 11:50  | 7.15                          | 4.7E                | 62.3                 | 2,418              | 832.1                | 180.8             |
| tanen1a              | 9041              | 5/12/2006 16:40  | 7.63                          | --                  | --                   | --                 | --                   | --                |
| tanen1a              | 9056              | 5/24/2006 11:00  | 7.85                          | <0.9                | 36.1                 | 1,397              | 568.8                | 115.2             |
| tanen1a              | 9071              | 6/8/2006 16:00   | 7.78                          | 6.9E                | 43.8                 | 1,945              | 787.0                | 239.1             |
| tanen1a              | 9107              | 7/18/2006 --     | 7.95                          | <0.9                | 51.1                 | 1,656              | 676.1                | 162.2             |
| tanen1a              | 9137              | 10/3/2006 11:00  | 7.82                          | --                  | --                   | --                 | --                   | --                |
| tanen1a              | 9154              | 3/30/2007 13:13  | 7.28                          | <0.9                | 54.2                 | 2,346              | 784.4                | 225.1             |
| tanen1a              | 9155              | 3/30/2007 13:30  | 7.37                          | --                  | --                   | --                 | --                   | --                |
| tanen1a              | 9171              | 5/22/2007 21:10  | 7.64                          | <0.9                | 47.6                 | 1,709              | 576.2                | 170.2             |
| tanen1a              | 9200              | 6/8/2007 13:30   | 7.97                          | <0.9                | 44.5                 | 1,737              | 655.6                | 227.0             |
| tanen1a              | 9207              | 6/21/2007 14:45  | 7.88                          | <0.9                | 49.5                 | 1,711              | 625.8                | 309.1             |

**Table 17.** Water quality, field measurements and laboratory analyses – Tanana River at Nenana, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| tanen1a              | 9219              | 7/5/2007 18:05   | 7.92                          | <0.9                | 52.2                 | 1,682              | 596.1                | 254.6             |
| tanen1a              | 9238              | 7/20/2007 20:00  | 7.98                          | <0.9                | 39.1                 | 1,643              | 593.3                | 242.6             |
| tanen1a              | 9241              | 7/20/2007 20:00  | 7.98                          | <0.9                | 44.5                 | 1,620              | 492.4                | 206.1             |
| tanen1a              | 9263              | 8/6/2007 14:00   | 7.85                          | <0.9                | 30.2                 | 1,622              | 533.6                | 301.8             |
| tanen1a              | 9275              | 8/20/2007 12:03  | 7.82                          | <0.9                | 28.2                 | 1,220              | 414.0                | 98.30             |
| tanen1a              | 9396              | 4/14/2008 16:04  | 7.60                          | 17                  | 56.4                 | 2,269              | 692.2                | 206.3             |
| tanen1a              | 9397              | 3/27/2008 14:09  | 7.33                          | 18                  | 57.1                 | 2,277              | 701.8                | 206.4             |
| tanen1a              | 9420              | 6/2/2008 14:02   | 7.50                          | <0.9                | 54.5                 | 1,825              | 747.9                | 195.6             |
| tanen1a              | 9432              | 6/16/2008 12:14  | 7.61                          | <0.9                | 55.3                 | 1,734              | 750.5                | 168.1             |
| tanen1a              | 9454              | 6/30/2008 11:24  | 7.53                          | <0.9                | 47.8                 | 1,737              | 687.3                | 169.1             |
| tanen1a              | 9695              | 7/14/2008 12:30  | 7.91                          | <0.9                | 35.7                 | 1,749              | 593.1                | 369.7             |
| tanen1a              | 9781              | 7/28/2008 12:40  | 7.74                          | <0.9                | 39.8                 | 1,874              | 673.4                | 302.8             |
| tanen1a              | 9869              | 9/8/2008 11:45   | 7.62                          | <0.9                | 38.2                 | 2,034              | 758.0                | 220.5             |
| tanen1a              | 9881              | 8/25/2008 11:50  | 7.54                          | <0.9                | 60.3                 | 1,864              | 745.3                | 175.5             |

**Table 17.** Water quality, field measurements and laboratory analyses – Tanana River at Nenana, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| tanen1a              | 9010              | 3/23/2006 11:50  | 2,543                            | 48.3                | 15.8               | 792.3              | 1                        |
| tanen1a              | 9041              | 5/12/2006 16:40  | 1,618                            | 58.9                | 9.60               | 666.5              | --                       |
| tanen1a              | 9056              | 5/24/2006 11:00  | 1,281                            | 24.9                | 11.0               | 660.7              | 3                        |
| tanen1a              | 9071              | 6/8/2006 16:00   | 1,903                            | 101                 | 9.30               | 881.3              | 2                        |
| tanen1a              | 9107              | 7/18/2006 --     | 1,419                            | 27.9                | 6.80               | 944.1              | 3                        |
| tanen1a              | 9137              | 10/3/2006 11:00  | --                               | 81.8                | 15.5               | 1198               | --                       |
| tanen1a              | 9154              | 3/30/2007 13:13  | 2,534                            | 60.8                | 12.5               | 954.4              | -2                       |
| tanen1a              | 9155              | 3/30/2007 13:30  | --                               | --                  | --                 | --                 | --                       |
| tanen1a              | 9171              | 5/22/2007 21:10  | 1,421                            | 44.4                | 5.90               | 782.3              | 5                        |
| tanen1a              | 9200              | 6/8/2007 13:30   | 1,635                            | 77.2                | 3.80               | 913.4              | 1                        |
| tanen1a              | 9207              | 6/21/2007 14:45  | 1,630                            | 77.8                | 6.80               | 901.4              | 1                        |

**Table 17.** Water quality, field measurements and laboratory analyses – Tanana River at Nenana, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| tanen1a              | 9219              | 7/5/2007 18:05   | 1,474                            | 71.4                | 5.70               | 973.6              | 1                        |
| tanen1a              | 9238              | 7/20/2007 20:00  | 1,471                            | 50.2                | 6.10               | 1,083              | -2                       |
| tanen1a              | 9241              | 7/20/2007 20:00  | 1,438                            | 52.8                | 5.80               | 862                | 0                        |
| tanen1a              | 9263              | 8/6/2007 14:00   | 1,486                            | 46.3                | 3.30               | 863.6              | 2                        |
| tanen1a              | 9275              | 8/20/2007 12:03  | 1,133                            | 25.5                | 22.3               | 560.5              | 1                        |
| tanen1a              | 9396              | 4/14/2008 16:04  | 2,499                            | 41.9                | 10.1               | 767.7              | 4                        |
| tanen1a              | 9397              | 3/27/2008 14:09  | 2,535                            | 42.0                | 10.4               | 758.4              | 2                        |
| tanen1a              | 9420              | 6/2/2008 14:02   | 1,855                            | 63.8                | 27.0               | 922.5              | 1                        |
| tanen1a              | 9432              | 6/16/2008 12:14  | 1,587                            | 58.8                | 28.2               | 1,013              | 3                        |
| tanen1a              | 9454              | 6/30/2008 11:24  | 1,494                            | 52.6                | 8.30               | 1,056              | -2                       |
| tanen1a              | 9695              | 7/14/2008 12:30  | 1,561                            | 33.2                | 11.6               | 1,050              | 4                        |
| tanen1a              | 9781              | 7/28/2008 12:40  | 1,691                            | 63.3                | 9.30               | 1,035              | 2                        |
| tanen1a              | 9869              | 9/8/2008 11:45   | --                               | 50.0                | 11.1               | 951.4              | --                       |
| tanen1a              | 9881              | 8/25/2008 11:50  | 1,674                            | 41.7                | 13.3               | 951.9              | 3                        |

**Table 17.** Water quality, field measurements and laboratory analyses – Tanana River at Nenana, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| tanen1a                 | 9010                 | 3/23/2006 11:50  | 0.026                         | 1.7  | 1.60                                  | 2,850                      | 3,372                                   | 23.8             | -168.7               | -21.77                |
| tanen1a                 | 9041                 | 5/12/2006 16:40  | 0.163                         | 2.9  | 5.70                                  | 1,440                      | 1,869                                   | 25.3             | -165.0               | -21.06                |
| tanen1a                 | 9056                 | 5/24/2006 11:00  | 0.308                         | 3.2  | 9.60                                  | 1,260                      | 1,499                                   | 9.1              | -166.5               | -21.4                 |
| tanen1a                 | 9071                 | 6/8/2006 16:00   | 0.099                         | 2.8  | 3.50                                  | --                         | 1,404                                   | --               | -167.0               | -21.58                |
| tanen1a                 | 9107                 | 7/18/2006 --     | 0.048                         | 1.2  | 3.90                                  | 935                        | 1,680                                   | 8.1              | -167.2               | -21.72                |
| tanen1a                 | 9137                 | 10/3/2006 11:00  | 0.059                         | 2.0  | 3.00                                  | 1,394                      | 2,373                                   | 39.6             | -164.5               | -21.37                |
| tanen1a                 | 9154                 | 3/30/2007 13:13  | 0.022                         | 1.9  | 1.20                                  | 3,240                      | 3,251                                   | 54.6             | -168.1               | -21.81                |
| tanen1a                 | 9155                 | 3/30/2007 13:30  | 0.046                         | 1.9  | 2.50                                  | 3,215                      | 3,221                                   | 55.3             | --                   | --                    |
| tanen1a                 | 9171                 | 5/22/2007 21:10  | 0.226                         | 3.0  | 7.70                                  | 1,835                      | 2,934                                   | 21.1             | -168.5               | -21.5                 |
| tanen1a                 | 9200                 | 6/8/2007 13:30   | 0.097                         | 2.5  | 3.90                                  | 1,167                      | 2,705                                   | 11.6             | -168.8               | -21.91                |
| tanen1a                 | 9207                 | 6/21/2007 14:45  | 0.120                         | 4.2  | 2.90                                  | 812                        | 1,691                                   | 8.5              | -169.4               | -21.89                |

**Table 17.** Water quality, field measurements and laboratory analyses – Tanana River at Nenana, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| tanen1a                 | 9219                 | 7/5/2007 18:05   | 0.041                         | 3.0  | 1.40                                  | --                         | --                                      | --               | -169.8               | -20.73                |
| tanen1a                 | 9238                 | 7/20/2007 20:00  | 0.075                         | 3.7  | 2.10                                  | 1,005                      | 1,655                                   | 9.7              | -170.1               | -22.03                |
| tanen1a                 | 9241                 | 7/20/2007 20:00  | 0.064                         | 1.6  | 4.00                                  | 968                        | 1,600                                   | 9.5              | -170.3               | -22.08                |
| tanen1a                 | 9263                 | 8/6/2007 14:00   | 0.022                         | 1.5  | 1.50                                  | 406                        | 1,656                                   | 9.9              | -169.3               | -22.01                |
| tanen1a                 | 9275                 | 8/20/2007 12:03  | 0.204                         | 3.4  | 6.00                                  | 828.0                      | 1,699                                   | 10.8             | -146.7               | -18.94                |
| tanen1a                 | 9396                 | 4/14/2008 16:04  | 0.031                         | 2.0  | 1.50                                  | 2,073                      | 3,044                                   | 59.1             | -168.5               | -21.72                |
| tanen1a                 | 9397                 | 3/27/2008 14:09  | 0.031                         | 2.0  | 1.60                                  | 2,451                      | 3,068                                   | 56.5             | -168.5               | -21.66                |
| tanen1a                 | 9420                 | 6/2/2008 14:02   | 0.110                         | 2.1  | 5.20                                  | n/a                        | n/a                                     | n/a              | -167.2               | -21.56                |
| tanen1a                 | 9432                 | 6/16/2008 12:14  | 0.109                         | 3.0  | 3.60                                  | 1,346                      | 2,148                                   | 11.8             | -167.3               | -21.54                |
| tanen1a                 | 9454                 | 6/30/2008 11:24  | 0.088                         | 2.1  | 4.20                                  | 1,269                      | 2,016                                   | 17.9             | -167.5               | -22.03                |
| tanen1a                 | 9695                 | 7/14/2008 12:30  | 0.137                         | 2.6  | 5.40                                  | n/a                        | n/a                                     | n/a              | -165.2               | -21.72                |
| tanen1a                 | 9781                 | 7/28/2008 12:40  | 0.114                         | 2.2  | 5.10                                  | 967                        | --                                      | 19.7             | -164.7               | -21.43                |
| tanen1a                 | 9869                 | 9/8/2008 11:45   | 0.120                         | 2.9  | 4.10                                  | 1,209                      | 2,061                                   | 32.6             | -169.9               | -21.20                |
| tanen1a                 | 9881                 | 8/25/2008 11:50  | 0.133                         | 3.3  | 4.10                                  | 1,046                      | 1,901                                   | 33.0             | -168.7               | -21.00                |

**Table 18.** Water quality, field measurements, and laboratory analyses – Tanana River above Eilson, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million; δ <sup>2</sup> D, deuterium; δ <sup>18</sup> O, oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| tafai3a              | 9157              | 4/17/2007 13:33  | Under ice      | 11.71                 | 0.01                    | 13.2               | 8.20                               | 273                             |
| tafai3a              | 9172              | 5/25/2007 14:09  | Open water     | 27.7                  | 17.0                    | --                 | 8.11                               | 190                             |
| tafai3a              | 9191              | 6/8/2007 19:10   | Open water     | --                    | 12.2                    | 11.0               | 7.971                              | 178                             |
| tafai3a              | 9210              | 6/21/2007 19:34  | Open water     | --                    | 16.8                    | 9.92               | 8.25                               | 200                             |
| tafai3a              | 9225              | 7/6/2007 22:15   | Open water     | 19.0                  | 14.3                    | 10.1               | 8.17                               | 190                             |
| tafai3a              | 9234              | 7/18/2007 15:03  | Open water     | 31.6                  | 16.5                    | 10.4               | 7.61                               | 231                             |
| tafai3a              | 9264              | 8/3/2007 21:35   | Open water     | 17.5                  | 14.7                    | --                 | 7.90                               | 230                             |
| tafai3a              | 9278              | 8/20/2007 19:00  | Open water     | 20.7                  | 13.8                    | --                 | --                                 | 226                             |
| tafai3a              | 9283              | 9/2/2007 16:17   | Open water     | 23.8                  | 11.2                    | 11.1               | 8.20                               | 239                             |
| tafai3a              | 9392              | 4/12/2008 18:12  | Under ice      | 2.20                  | -0.04                   | 11.9               | 8.50                               | 330                             |

**Table 18.** Water quality, field measurements, and laboratory analyses – Tanana River above Eilson, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| tafai3a              | 9418              | 6/2/2008 17:34   | Open water     | 25.2                  | 13.1                    | 10.7               | 8.18                               | 270                             |
| tafai3a              | 9438              | 6/16/2008 19:24  | Open water     | 18.8                  | 14.2                    | 10.4               | 8.08                               | 247                             |
| tafai3a              | 9458              | 6/30/2008 19:43  | Open water     | 19.3                  | 16.4                    | 10.2               | 8.07                               | 224                             |
| tafai3a              | 9702              | 7/14/2008 18:00  | Open water     | 20.3                  | 13.4                    | 13.4               | 8.15                               | 238                             |
| tafai3a              | 9868              | 9/8/2008 18:15   | Open water     | 16.1                  | 10.3                    | --                 | 8.20                               | 291                             |
| tafai3a              | 9888              | 8/25/2008 18:35  | Open Water     | 23.9                  | 10.9                    | 11.5               | 8.01                               | 265                             |

**Table 18.** Water quality, field measurements, and laboratory analyses – Tanana River above Eilson, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| tafai3a              | 9157              | 4/17/2007 13:33  | 8.20                          | --                  | --                   | --                 | --                   | --                |
| tafai3a              | 9172              | 5/25/2007 14:09  | 8.11                          | <0.9                | 72.0                 | 1,768              | 612.2                | 163.6             |
| tafai3a              | 9191              | 6/8/2007 19:10   | 7.97                          | <0.9                | 52.5                 | 1,708              | 622.2                | 191.1             |
| tafai3a              | 9210              | 6/21/2007 19:34  | 8.25                          | <0.9                | 39.6                 | 1,629              | 587.5                | 344.0             |
| tafai3a              | 9225              | 7/6/2007 22:15   | 8.17                          | <0.9                | 46.5                 | 1,557              | 558.7                | 313.2             |
| tafai3a              | 9234              | 7/18/2007 15:03  | 7.61                          | <0.9                | 32.0                 | 1,452              | 527.6                | 352.0             |
| tafai3a              | 9264              | 8/3/2007 21:35   | 7.90                          | <0.9                | 29.7                 | 1,465              | 557.5                | 480.2             |
| tafai3a              | 9278              | 8/20/2007 19:00  | --                            | --                  | --                   | --                 | --                   | --                |
| tafai3a              | 9283              | 9/2/2007 16:17   | 7.69                          | <0.9                | 44.2                 | 1,660              | 534.5                | 196.5             |
| tafai3a              | 9392              | 4/12/2008 18:12  | 8.51                          | 7.7E                | 54.2                 | 2,321              | 707.0                | 186.7             |

**Table 18.** Water quality, field measurements, and laboratory analyses – Tanana River above Eilson, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| tafai3a              | 9418              | 6/2/2008 17:34   | 8.18                          | <0.9                | 53.9                 | 1,841              | 762.9                | 205.9             |
| tafai3a              | 9438              | 6/16/2008 19:24  | 8.08                          | 4.0E                | 51.9                 | 1,689              | 674.0                | 173.5             |
| tafai3a              | 9458              | 6/30/2008 19:43  | 8.07                          | <0.9                | 44.1                 | 1,714              | 708.8                | 189.9             |
| tafai3a              | 9702              | 7/14/2008 18:00  | 8.15                          | <0.9                | 33.5                 | 1,718              | 581.8                | 391.0             |
| tafai3a              | 9868              | 9/8/2008 18:15   | 7.85                          | <0.9                | 33.6                 | 1,987              | 740.2                | 256.7             |
| tafai3a              | 9888              | 8/25/2008 18:35  | 8.01                          | <0.9                | 37.1                 | 1,829              | 727.0                | 277.6             |

**Table 18.** Water quality, field measurements, and laboratory analyses – Tanana River above Eilson, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| tafai3a              | 9157              | 4/17/2007 13:33  | 2,259                            | 35.9                | 7.300              | 871.3              | --                       |
| tafai3a              | 9172              | 5/25/2007 14:09  | 1,652                            | 71.0                | 4.10               | 819.6              | 1                        |
| tafai3a              | 9191              | 6/8/2007 19:10   | 1,587                            | 72.2                | 7.30               | 880.0              | 1                        |
| tafai3a              | 9210              | 6/21/2007 19:34  | 1,559                            | 98.3                | 6.40               | 861.7              | 1                        |
| tafai3a              | 9225              | 7/6/2007 22:15   | 1,504                            | 74.7                | 6.00               | 904.3              | 0                        |
| tafai3a              | 9234              | 7/18/2007 15:03  | 1,487                            | 78.8                | 5.60               | 975.7              | -4                       |
| tafai3a              | 9264              | 8/3/2007 21:35   | 1,537                            | 1.40E               | 0.50E              | 796.1              | 4                        |
| tafai3a              | 9278              | 8/20/2007 19:00  | --                               | --                  | --                 | --                 | --                       |
| tafai3a              | 9283              | 9/2/2007 16:17   | 1,499                            | 55.1                | 5.80               | 816.6              | 1                        |
| tafai3a              | 9392              | 4/12/2008 18:12  | 2,488                            | 38.0                | 7.90               | 786.0              | 2                        |

**Table 18.** Water quality, field measurements, and laboratory analyses – Tanana River above Eilson, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| tafai3a              | 9418              | 6/2/2008 17:34   | 1,825                            | 74.7                | 26.1               | 997.4              | 2                        |
| tafai3a              | 9438              | 6/16/2008 19:24  | 1,526                            | 63.9                | 30.8               | 919.2              | 4                        |
| tafai3a              | 9458              | 6/30/2008 19:43  | 1,512                            | 54.5                | 8.30               | 1017               | 7                        |
| tafai3a              | 9702              | 7/14/2008 18:00  | 1,579                            | 30.4                | 9.40               | 1016               | 2                        |
| tafai3a              | 9868              | 9/8/2008 18:15   | 1,815                            | 74.6                | 8.80               | 967.5              | 2                        |
| tafai3a              | 9888              | 8/25/2008 18:35  | 1,634                            | 84.6                | 10.9               | 983.2              | 2                        |

**Table 18.** Water quality, field measurements, and laboratory analyses – Tanana River above Eilson, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| tafai3a                 | 9157                 | 4/17/2007 13:33  | 0.247                         | 3.4  | 7.30                                  | 1,025                      | 2,553                                   | 5.1              | -167.9             | -21.87                |
| tafai3a                 | 9172                 | 5/25/2007 14:09  | 0.173                         | 3.1  | 5.60                                  | 1,280                      | 2,769                                   | 4.4              | -169.9             | -21.91                |
| tafai3a                 | 9191                 | 6/8/2007 19:10   | 0.110                         | 2.5  | 4.30                                  | 1,997                      | 2,439                                   | 3.2              | -170.6             | -22.04                |
| tafai3a                 | 9210                 | 6/21/2007 19:34  | 0.065                         | 2.6  | 2.50                                  | 3,477                      | 1,626                                   | 3.5              | -173.0             | -19.39                |
| tafai3a                 | 9225                 | 7/6/2007 22:15   | 0.072                         | 4.7  | 1.50                                  | --                         | --                                      | --               | -172.7             | -22.52                |
| tafai3a                 | 9234                 | 7/18/2007 15:03  | 0.091                         | 2.0  | 4.50                                  | 768                        | 1,615                                   | 2.9              | -171.7             | -22.42                |
| tafai3a                 | 9264                 | 8/3/2007 21:35   | 0.056                         | 2.4  | 2.30                                  | 520                        | 1,542                                   | 2.0              | -170.8             | -22.29                |
| tafai3a                 | 9278                 | 8/20/2007 19:00  | 0.058                         | 3.6  | 1.70                                  | 733                        | 1,579                                   | 4.2              | -170.6             | -22.28                |
| tafai3a                 | 9283                 | 9/2/2007 16:17   | 0.051                         | 1.5  | 3.40                                  | 838                        | 1,751                                   | 3.3              | -170.4             | -22.22                |
| tafai3a                 | 9392                 | 4/12/2008 18:12  | 0.017                         | 1.6  | 1.00                                  | 1,314                      | 2,923                                   | 7.4              | -170.7             | -21.99                |

**Table 18.** Water quality, field measurements and laboratory analyses – Tanana River above Eilson, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| tafai3a                 | 9418                 | 6/2/2008 17:34   | 0.084                         | 2.7  | 3.20                                  | n/a                        | n/a                                     | n/a              | -169.9               | -21.95                |
| tafai3a                 | 9438                 | 6/16/2008 19:24  | 0.095                         | 3.0  | 3.10                                  | n/a                        | n/a                                     | n/a              | -168.7               | -21.84                |
| tafai3a                 | 9458                 | 6/30/2008 19:43  | 0.089                         | 2.3  | 3.90                                  | n/a                        | n/a                                     | n/a              | -168.7               | -22.26                |
| tafai3a                 | 9702                 | 7/14/2008 18:00  | 0.121                         | 3.0  | 4.00                                  | n/a                        | n/a                                     | n/a              | -170.9               | -22.13                |
| tafai3a                 | 9868                 | 9/8/2008 18:15   | 0.121                         | 3.3  | 3.60                                  | n/a                        | n/a                                     | n/a              | -171.3               | -21.70                |
| tafai3a                 | 9888                 | 8/25/2008 18:35  | 0.121                         | 4.3  | 2.80                                  | n/a                        | n/a                                     | n/a              | -172.0               | -21.80                |

**Table 19.** Water quality, field measurements, and laboratory analyses – Tanana River near Salcha, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| tafai2a              | 9007              | 3/25/2006 16:35  | Under ice      | --                                    | -0.03                                   | 10.4               | 8.19                               | 312                                                 |
| tafai2a              | 9039              | 5/11/2006 16:54  | Open water     | 11.16                                 | 4.17                                    | 14.5               | 7.47                               | 221                                                 |
| tafai2a              | 9052              | 5/23/2006 13:30  | Open water     | 21.7                                  | 7.78                                    | 11.2               | 7.42                               | 152                                                 |
| tafai2a              | 9070              | 6/7/2006 --      | Open water     | --                                    | 11.2                                    | 11.4               | 7.87                               | 183                                                 |
| tafai2a              | 9108              | 7/17/2006 13:40  | Open water     | --                                    | 12.6                                    | 10.2               | 7.62                               | 244                                                 |
| tafai2a              | 9116              | 8/8/2006 15:00   | Open water     | 14.25                                 | 13.4                                    | 10.7               | 7.56                               | 254                                                 |
| tafai2a              | 9133              | 10/4/2006 12:46  | Open water     | 7.40                                  | 4.63                                    | --                 | 8.02                               | 181                                                 |

**Table 19.** Water quality, field measurements and laboratory analyses – Tanana River near Salcha, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| tafai2a              | 9007              | 3/25/2006 16:35  | 7.55                          | <0.9                | 54.0                 | 2,220              | 758.4                | 149.4             |
| tafai2a              | 9039              | 5/11/2006 16:54  | 7.73                          | --                  | --                   | --                 | --                   | --                |
| tafai2a              | 9052              | 5/23/2006 13:30  | 7.70                          | <0.9                | 29.1                 | 1,066              | 442.3                | 84.10             |
| tafai2a              | 9070              | 6/7/2006 --      | 8.19                          | <0.9                | 41.6                 | 1,828              | 751.5                | 214.8             |
| tafai2a              | 9108              | 7/17/2006 13:40  | 7.98                          | <0.9                | 47.0                 | 1,599              | 632.7                | 179.7             |
| tafai2a              | 9116              | 8/8/2006 15:00   | 7.70                          | <0.9                | 43.2                 | 1,646              | 667.2                | 163.7             |
| tafai2a              | 9133              | 10/4/2006 12:46  | 7.37                          | <0.9                | 44.4                 | 2,103              | 876.2                | 177.9             |

**Table 19.** Water quality, field measurements and laboratory analyses – Tanana River near Salcha, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>( $\mu\text{eq/L}$ ) | Chloride<br>( $\mu\text{eq/L}$ ) | Nitrate<br>( $\mu\text{eq/L}$ ) | Sulfate<br>( $\mu\text{eq/L}$ ) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|-----------------------------------------------|----------------------------------|---------------------------------|---------------------------------|--------------------------|
| tafai2a              | 9007              | 3/25/2006 16:35  | 2,355                                         | 37.2                             | 13.7                            | 787.3                           | 0                        |
| tafai2a              | 9039              | 5/11/2006 16:54  | 1,542                                         | 24.2                             | 11.2                            | 662.3                           | --                       |
| tafai2a              | 9052              | 5/23/2006 13:30  | 977                                           | 18.7                             | 9.80                            | 468.0                           | 5                        |
| tafai2a              | 9070              | 6/7/2006 --      | 1,723                                         | 88.2                             | 9.40                            | 841.9                           | 3                        |
| tafai2a              | 9108              | 7/17/2006 13:40  | 1,393                                         | 37.0                             | 5.80                            | 895.5                           | 3                        |
| tafai2a              | 9116              | 8/8/2006 15:00   | 1,448                                         | 41.0                             | 7.20                            | 923.4                           | 2                        |
| tafai2a              | 9133              | 10/4/2006 12:46  | 1,905                                         | 38.4                             | 12.4                            | 1082                            | 3                        |

**Table 19.** Water quality, field measurements and laboratory analyses – Tanana River near Salcha, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| tafai2a                 | 9007                 | 3/25/2006 16:35  | 0.030                         | 1.7  | 1.70                                  | 1,686                      | 2,912                                   | 4.9              | -168.9               | -21.91                |
| tafai2a                 | 9039                 | 5/11/2006 16:54  | 0.143                         | 2.8  | 5.10                                  | 1,129                      | 1,781                                   | 5.3              | -165.2               | -21.25                |
| tafai2a                 | 9052                 | 5/23/2006 13:30  | 0.367                         | 3.5  | 10.6                                  | 1,556                      | 1,130                                   | 4.2              | -168.7               | -21.65                |
| tafai2a                 | 9070                 | 6/7/2006 --      | 0.097                         | 2.9  | 3.40                                  | 4,036                      | 2,017                                   | 4.1              | -168.1               | -21.59                |
| tafai2a                 | 9108                 | 7/17/2006 13:40  | 0.038                         | 1.0  | 3.90                                  | 599                        | 1,602                                   | 3.1              | -168.9               | -22.00                |
| tafai2a                 | 9116                 | 8/8/2006 15:00   | 0.038                         | 1.0  | 3.80                                  | 902                        | 1,714                                   | 5.9              | -168.9               | -21.91                |
| tafai2a                 | 9133                 | 10/4/2006 12:46  | 0.057                         | 1.9  | 3.10                                  | 863                        | 2,248                                   | 4.3              | -165.1               | -21.36                |

**Table 20.** Water quality, field measurements, and laboratory analyses – Tanana River below Chena River, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| tafai1b              | 9053              | 5/23/2006 --     | Open water     | 29.1                                  | 10.0                                    | 11.7               | 7.52                               | 194                                                 |
| tafai1b              | 9068              | 6/8/2006 12:35   | Open water     | --                                    | 12.3                                    | 12.1               | 7.90                               | 221                                                 |
| tafai1b              | 9109              | 7/17/2006 16:00  | Open water     | --                                    | 13.1                                    | 10.1               | 7.60                               | 240                                                 |
| tafai1b              | 9115              | 8/8/2006 16:20   | Open water     | 18.3                                  | 14.2                                    | 10.1               | 7.66                               | 208                                                 |
| tafai1b              | 9132              | 10/2/2006 11:45  | Open water     | 3.17                                  | 2.47                                    | --                 | 7.65                               | 206                                                 |
| tafai1b              | 9138              | 10/2/2006 12:30  | Open water     | 4.76                                  | 2.90                                    | --                 | 8.03                               | 303                                                 |
| tafai1b              | 9159              | 4/16/2007 15:07  | Under ice      | 12.9                                  | 1.10                                    | --                 | 8.07                               | 264                                                 |
| tafai1b              | 9177              | 5/22/2007 14:56  | Open water     | --                                    | 11.7                                    | -2.88              | 7.98                               | 199                                                 |
| tafai1b              | 9188              | 6/5/2007 12:12   | Open water     | 16.8                                  | 14.7                                    | -0.07              | 7.98                               | 202                                                 |
| tafai1b              | 9203              | 6/19/2007 14:42  | Open water     | n/a                                   | 16.9                                    | 9.93               | 8.31                               | 196                                                 |

**Table 20.** Water quality, field measurements and laboratory analyses – Tanana River below Chena River, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| tafailb              | 9217              | 7/5/2007 14:40   | Open water     | 23.0                  | 16.4                    | 2.27               | 8.32                               | 190                             |
| tafailb              | 9245              | 7/18/2007 11:39  | Open water     | 24.0                  | 16.1                    | 10.1               | 7.60                               | 231                             |
| tafailb              | 9257              | 8/2/2007 15:03   | Open water     | 19.0                  | 15.7                    | --                 | 7.85                               | 177                             |
| tafailb              | 9273              | 8/20/2007 15:50  | Open water     | 21.7                  | 15.0                    | --                 | 7.35                               | 223                             |
| tafailb              | 9285              | 9/2/2007 12:55   | Open water     | 14.0                  | 11.0                    | 11.1               | 7.72                               | 242                             |
| tafailb              | 9393              | 4/14/2008 13:55  | Under ice      | 1.3                   | 0.00                    | 12.1               | 8.49                               | 293                             |
| tafailb              | 9422              | 6/2/2008 21:40   | Open water     | 20.3                  | 14.5                    | 10.3               | 8.09                               | 259                             |
| tafailb              | 9433              | 6/16/2008 15:41  | Open water     | 19.4                  | 15.2                    | 10.2               | 8.03                               | 250                             |
| tafailb              | 9455              | 6/30/2008 15:47  | Open water     | 13.4                  | 13.9                    | 11.8               | 8.22                               | 232                             |
| tafailb              | 9698              | 7/14/2008 15:51  | Open water     | 17.7                  | 14.3                    | 11.4               | 7.96                               | 214                             |
| tafailb              | 9775              | 7/28/2008 16:05  | Open water     | 19.0                  | 12.6                    | 11.1               | 8.08                               | 238                             |
| tafailb              | 9867              | 9/9/2008 15:51   | Open water     | 13.0                  | 10.2                    | --                 | 8.19                               | 282                             |
| tafailb              | 9883              | 8/25/2008 15:40  | Open water     | 16.4                  | 10.6                    | 11.6               | 7.89                               | 251                             |

**Table 20.** Water quality, field measurements and laboratory analyses – Tanana River below Chena River, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| tafai1b              | 9053              | 5/23/2006 --     | 7.85                          | <0.9                | 34.0                 | 1,305              | 520.2                | 107.6             |
| tafai1b              | 9068              | 6/8/2006 12:35   | 8.18                          | <0.9                | 44.5                 | 1,908              | 765.3                | 227.5             |
| tafai1b              | 9109              | 7/17/2006 16:00  | 7.96                          | <0.9                | 50.8                 | 1,574              | 622.7                | 159.4             |
| tafai1b              | 9115              | 8/8/2006 16:20   | 8.01                          | 3.0E                | 46.9                 | 1,705              | 691.0                | 174.2             |
| tafai1b              | 9132              | 10/2/2006 11:45  | 7.64                          | 1.6E                | 30.6                 | 1,457              | 530.8                | 107.7             |
| tafai1b              | 9138              | 10/2/2006 12:30  | 8.11                          | <0.9                | 48.1                 | 2,104              | 868.8                | 182.6             |
| tafai1b              | 9159              | 4/16/2007 15:07  | 7.84                          | <0.9                | 57.1                 | 2,004              | 675.1                | 176.1             |
| tafai1b              | 9177              | 5/22/2007 14:56  | 7.43                          | <0.9                | 42.8                 | 1,698              | 560.8                | 188.3             |
| tafai1b              | 9188              | 6/5/2007 12:12   | 8.01                          | <0.9                | 45.4                 | 1,703              | 560.8                | 234.3             |
| tafai1b              | 9203              | 6/19/2007 14:42  | 7.99                          | <0.9                | 47.0                 | 1,615              | 582.6                | 305.4             |

**Table 20.** Water quality, field measurements, and laboratory analyses – Tanana River below Chena River, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| tafai1b              | 9217              | 7/5/2007 14:40   | 7.96                          | <0.9                | 44.7                 | 1,620              | 555.0                | 318.3             |
| tafai1b              | 9245              | 7/18/2007 11:39  | 7.90                          | <0.9                | 40.3                 | 1,573              | 504.7                | 372.2             |
| tafai1b              | 9257              | 8/2/2007 15:03   | 8.02                          | <0.9                | 25.5                 | 1,462              | 478.9                | 633.9             |
| tafai1b              | 9273              | 8/20/2007 15:50  | 8.13                          | <0.9                | 83.9                 | 1,540              | 481.6                | 265.2             |
| tafai1b              | 9285              | 9/2/2007 12:55   | 7.97                          | <0.9                | 42.4                 | 1,635              | 418.2                | 174.4             |
| tafai1b              | 9393              | 4/14/2008 13:55  | 6.89                          | 11                  | 56.9                 | 2,247              | 683.2                | 194.9             |
| tafai1b              | 9422              | 6/2/2008 21:40   | 7.74                          | <0.9                | 52.7                 | 1,773              | 727.3                | 193.3             |
| tafai1b              | 9433              | 6/16/2008 15:41  | 7.79                          | <0.9                | 52.1                 | 1,727              | 706.1                | 174.7             |
| tafai1b              | 9455              | 6/30/2008 15:47  | 7.69                          | <0.9                | 32.9                 | 1,624              | 671.7                | 289.7             |
| tafai1b              | 9698              | 7/14/2008 15:51  | 7.80                          | <0.9                | 26.6                 | 1,680              | 557.3                | 424.4             |
| tafai1b              | 9775              | 7/28/2008 16:05  | 7.81                          | 6.9E                | 35.9                 | 1,751              | 615.5                | 293.6             |
| tafai1b              | 9867              | 9/9/2008 15:51   | 7.85                          | <0.9                | 44.4                 | 1,935              | 710.8                | 209.8             |
| tafai1b              | 9883              | 8/25/2008 15:40  | 7.75                          | <0.9                | 45.2                 | 1,743              | 676.8                | 211.9             |

**Table 20.** Water quality, field measurements and laboratory analyses – Tanana River below Chena River, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| tafailb              | 9053              | 5/23/2006 --     | 1,197                            | 26.2                | 11.4               | 563.1              | 4                        |
| tafailb              | 9068              | 6/8/2006 12:35   | 1,829                            | 97.6                | 8.50               | 862.2              | 3                        |
| tafailb              | 9109              | 7/17/2006 16:00  | 1,366                            | 33.4                | 6.90               | 875.9              | 3                        |
| tafailb              | 9115              | 8/8/2006 16:20   | 1,518                            | 46.1                | 8.00               | 946.3              | 2                        |
| tafailb              | 9132              | 10/2/2006 11:45  | 1,483                            | 29.5                | 20.8               | 497.5              | 2                        |
| tafailb              | 9138              | 10/2/2006 12:30  | 1,907                            | 42.4                | 11.8               | 1,097              | 2                        |
| tafailb              | 9159              | 4/16/2007 15:07  | 2,116                            | 52.1                | 10.2               | 845.8              | -2                       |
| tafailb              | 9177              | 5/22/2007 14:56  | 2,161                            | 58.6                | 6.10               | 714.4              | -8                       |
| tafailb              | 9188              | 6/5/2007 12:12   | 1,748                            | 85.8                | 6.40               | 835.9              | -3                       |
| tafailb              | 9203              | 6/19/2007 14:42  | 1,584                            | 81.9                | 7.20               | 813.8              | 1                        |

**Table 20.** Water quality, field measurements and laboratory analyses – Tanana River below Chena River, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| tafailb              | 9217              | 7/5/2007 14:40   | 1,486                            | 78.9                | 5.20               | 907.9              | 1                        |
| tafailb              | 9245              | 7/18/2007 11:39  | 1,495                            | 74.3                | 3.40               | 820.8              | 2                        |
| tafailb              | 9257              | 8/2/2007 15:03   | 1,584                            | 95.5                | 1.60               | 836.5              | 2                        |
| tafailb              | 9273              | 8/20/2007 15:50  | 1,377                            | 105                 | 3.10               | 826.1              | 1                        |
| tafailb              | 9285              | 9/2/2007 12:55   | 1,510                            | 50.7                | 7.70               | 836.1              | -3                       |
| tafailb              | 9393              | 4/14/2008 13:55  | 2,407                            | 46.3                | 9.9                | 772.5              | -1                       |
| tafailb              | 9422              | 6/2/2008 21:40   | 1,785                            | 68.5                | 26.3               | 893.1              | 0                        |
| tafailb              | 9433              | 6/16/2008 15:41  | 1,585                            | 64.8                | 26.7               | 950.0              | 1                        |
| tafailb              | 9455              | 6/30/2008 15:47  | 1,531                            | 62.4                | 9.20               | 926.0              | 2                        |
| tafailb              | 9698              | 7/14/2008 15:51  | 1,581                            | 35.6                | 10.9               | 954.5              | 2                        |
| tafailb              | 9775              | 7/28/2008 16:05  | 1,613                            | 64.1                | 10.0               | 955.4              | 1                        |
| tafailb              | 9867              | 9/9/2008 15:51   | 1,804                            | 78.9                | 5.20               | 907.9              | 2                        |
| tafailb              | 9883              | 8/25/2008 15:40  | 1,585                            | 74.3                | 3.40               | 820.8              | 3                        |

**Table 20.** Water quality, field measurements, and laboratory analyses – Tanana River below Chena River, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| tafai1b                 | 9053                 | 5/23/2006 --     | 0.323                         | 3.3  | 9.70                                  | 1,024                      | 1,404                                   | 5.0              | --                   | --                    |
| tafai1b                 | 9068                 | 6/8/2006 12:35   | 0.087                         | 2.6  | 3.40                                  | 2,198                      | 2,169                                   | 4.3              | -169.1               | -21.75                |
| tafai1b                 | 9109                 | 7/17/2006 16:00  | 0.050                         | 1.3  | 4.00                                  | 751.0                      | 1,600                                   | 5.8              | -166.7               | -21.84                |
| tafai1b                 | 9115                 | 8/8/2006 16:20   | 0.039                         | 2.0  | 2.00                                  | 1,199                      | 1,783                                   | 5.6              | -168.8               | -21.97                |
| tafai1b                 | 9132                 | 10/2/2006 11:45  | 0.091                         | 2.3  | 3.90                                  | 1,698                      | 1,844                                   | --               | -150.9               | -19.61                |
| tafai1b                 | 9138                 | 10/2/2006 12:30  | 0.052                         | 1.8  | 3.00                                  | 1,102                      | 2,280                                   | 5.7              | -166.1               | -21.39                |
| tafai1b                 | 9159                 | 4/16/2007 15:07  | 0.102                         | 3.0  | 3.40                                  | 2,843                      | 2,494                                   | 27.3             | -166.0               | -21.49                |
| tafai1b                 | 9177                 | 5/22/2007 14:56  | 0.247                         | 3.2  | 7.80                                  | 2,248                      | 2,811                                   | 5.8              | -166.6               | -21.55                |
| tafai1b                 | 9188                 | 6/5/2007 12:12   | 0.120                         | 2.6  | 4.60                                  | 1,269                      | 2,784                                   | 5.0              | -168.6               | -21.76                |
| tafai1b                 | 9203                 | 6/19/2007 14:42  | 0.116                         | 2.4  | 4.90                                  | 691.0                      | 2,260                                   | 3.6              | -169.2               | -21.99                |

**Table 20.** Water quality, field measurements, and laboratory analyses – Tanana River below Chena River, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| tafai1b                 | 9217                 | 7/5/2007 14:40   | 0.071                         | 5.5  | 1.30                                  | --                         | --                                      | --               | -171.3             | -21.28                |
| tafai1b                 | 9245                 | 7/18/2007 11:39  | 0.088                         | 2.0  | 4.40                                  | 1,156                      | 1,640                                   | 4.1              | -171.2             | -22.15                |
| tafai1b                 | 9257                 | 8/2/2007 15:03   | 0.056                         | 1.5  | 3.70                                  | 540.0                      | 1,609                                   | 9.6              | -169.3             | -22.08                |
| tafai1b                 | 9273                 | 8/20/2007 15:50  | 0.060                         | 1.6  | 3.60                                  | 644.0                      | 1,503                                   | 4.2              | -168.3             | -21.78                |
| tafai1b                 | 9285                 | 9/2/2007 12:55   | 0.066                         | 3.4  | 1.90                                  | 998.0                      | 1,769                                   | 7.4              | -166.9             | -21.83                |
| tafai1b                 | 9393                 | 4/14/2008 13:55  | 0.030                         | 1.9  | 1.60                                  | 1,105                      | 2,757                                   | 13.6             | -168.6             | -21.83                |
| tafai1b                 | 9422                 | 6/2/2008 21:40   | 0.097                         | 2.8  | 3.40                                  | n/a                        | n/a                                     | n/a              | -168.6             | -21.75                |
| tafai1b                 | 9433                 | 6/16/2008 15:41  | 0.096                         | 3.0  | 3.20                                  | n/a                        | n/a                                     | n/a              | -168.4             | -21.64                |
| tafai1b                 | 9455                 | 6/30/2008 15:47  | 0.133                         | 4.2  | 3.20                                  | n/a                        | n/a                                     | n/a              | -165.9             | -21.76                |
| tafai1b                 | 9698                 | 7/14/2008 15:51  | 0.147                         | 2.8  | 5.30                                  | n/a                        | n/a                                     | n/a              | -166.8             | -21.61                |
| tafai1b                 | 9775                 | 7/28/2008 16:05  | 0.120                         | 3.4  | 3.50                                  | n/a                        | n/a                                     | n/a              | -168.8             | -21.57                |
| tafai1b                 | 9867                 | 9/9/2008 15:51   | 0.149                         | 4.0  | 3.70                                  | n/a                        | n/a                                     | n/a              | -170.1             | -21.40                |
| tafai1b                 | 9883                 | 8/25/2008 15:40  | 0.108                         | 3.5  | 3.10                                  | n/a                        | n/a                                     | n/a              | -169.8             | -21.60                |

**Table 21.** Water quality, field measurements, and laboratory analyses – Upper Chena River, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| chfai5a              | 9014              | 4/17/2006 12:30  | Under ice      | --                                    | -0.04                                   | 10.3               | 7.42                               | 189                                                 |
| chfai5a              | 9037              | 5/11/2006 18:33  | Open water     | --                                    | 2.92                                    | 14.8               | 6.76                               | 116                                                 |
| chfai5a              | 9044              | 5/19/2006 15:30  | Open water     | --                                    | 3.52                                    | 13.6               | 7.27                               | 97.0                                                |
| chfai5a              | 9062              | 5/31/2006 --     | Open water     | 16.18                                 | 8.42                                    | 10.9               | 7.38                               | 165                                                 |
| chfai5a              | 9097              | 7/12/2006 12:56  | Open water     | --                                    | 12.48                                   | 10.2               | 7.37                               | 157                                                 |
| chfai5a              | 9114              | 8/8/2006 11:30   | Open water     | 15.04                                 | 11.84                                   | --                 | 7.45                               | 187                                                 |
| chfai5a              | 9139              | 10/4/2006 13:30  | Open water     | 6.60                                  | 3.50                                    | --                 | --                                 | 115                                                 |

**Table 21.** Water quality, field measurements, and laboratory analyses – Upper Chena River, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| chfai5a              | 9014              | 4/17/2006 12:30  | 6.65                          | --                  | --                   | --                 | --                   | --                |
| chfai5a              | 9037              | 5/11/2006 18:33  | 7.48                          | --                  | --                   | --                 | --                   | --                |
| chfai5a              | 9044              | 5/19/2006 15:30  | 7.28                          | <0.9                | 19.9                 | 717.9              | 268.6                | 37.90             |
| chfai5a              | 9062              | 5/31/2006 --     | 7.11                          | <0.9                | 20.2                 | 1,172              | 434.7                | 66.80             |
| chfai5a              | 9097              | 7/12/2006 12:56  | 7.45                          | <0.9                | 54.9                 | 1,175              | 411.6                | 66.40             |
| chfai5a              | 9114              | 8/8/2006 11:30   | 6.25                          | <0.9                | 21.6                 | 1,303              | 447.3                | 78.50             |
| chfai5a              | 9139              | 10/4/2006 13:30  | 7.71                          | --                  | --                   | --                 | --                   | --                |

**Table 21.** Water quality, field measurements, and laboratory analyses – Upper Chena River, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| chfai5a              | 9014              | 4/17/2006 12:30  | 1,420                            | 20.3                | 12.3               | 471.0              | --                       |
| chfai5a              | 9037              | 5/11/2006 18:33  | 768.0                            | 14.1                | 13.5               | 313.5              | --                       |
| chfai5a              | 9044              | 5/19/2006 15:30  | 654.0                            | 7.50                | 14.9               | 237.3              | 7                        |
| chfai5a              | 9062              | 5/31/2006 --     | 1,131                            | 11.8                | 17.4               | 414.4              | 4                        |
| chfai5a              | 9097              | 7/12/2006 12:56  | 1,101                            | 37.3                | 19.1               | 426.0              | 4                        |
| chfai5a              | 9114              | 8/8/2006 11:30   | 1,240                            | 6.30                | 14.5               | 512.9              | 2                        |
| chfai5a              | 9139              | 10/4/2006 13:30  | --                               | --                  | --                 | --                 | --                       |

**Table 21.** Water quality, field measurements, and laboratory analyses – Upper Chena River, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| chfai5a                 | 9014                 | 4/17/2006 12:30  | 0.117                         | 2.8  | 4.60                                  | 3,939                      | 1,948                                   | 15.8             | -149.0               | -19.32                |
| chfai5a                 | 9037                 | 5/11/2006 18:33  | 0.551                         | 3.5  | 15.9                                  | 1,322                      | 1,009                                   | 4.90             | n/a                  | n/a                   |
| chfai5a                 | 9044                 | 5/19/2006 15:30  | 0.538                         | 3.6  | 14.8                                  | 2,352                      | 786.0                                   | 4.50             | -163.9               | -21.15                |
| chfai5a                 | 9062                 | 5/31/2006 --     | 0.178                         | 3.4  | 5.30                                  | 2,964                      | 1,486                                   | 12.0             | -154.9               | -20.08                |
| chfai5a                 | 9097                 | 7/12/2006 12:56  | 0.194                         | 3.2  | 6.00                                  | 2,246                      | 1,079                                   | 9.60             | -150.3               | -19.45                |
| chfai5a                 | 9114                 | 8/8/2006 11:30   | 0.073                         | 2.0  | 3.70                                  | 1,270                      | 1,467                                   | 10.2             | -150.6               | -19.46                |
| chfai5a                 | 9139                 | 10/4/2006 13:30  | --                            | --   | --                                    | 1,534                      | 1,564                                   | 13.3             | --                   | --                    |

**Table 22.** Water quality, field measurements, and laboratory analyses – Chena River above Fairbanks.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million; δ <sup>2</sup> D, deuterium; δ <sup>18</sup> O, oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| chfai6a              | 9160              | 4/17/2007 20:24  | Under ice      | 12.6                  | 0.21                    | 8.71               | 7.66                               | --                              |
| chfai6a              | 9181              | 5/25/2007 11:00  | Open water     | 26.4                  | 12.1                    | --                 | 7.74                               | 127                             |
| chfai6a              | 9193              | 6/8/2007 17:17   | Open water     | n/a                   | 7.12                    | 11.6               | 7.44                               | 70.0                            |
| chfai6a              | 9211              | 6/21/2007 17:32  | Open water     | 28.5                  | 15.2                    | 11.4               | 7.91                               | 140                             |
| chfai6a              | 9227              | 7/6/2007 20:15   | Open water     | 29.0                  | 17.2                    | 10.1               | 8.10                               | 162                             |
| chfai6a              | 9235              | 7/18/2007 16:40  | Open water     | 26.6                  | 15.7                    | --                 | --                                 | 186                             |
| chfai6a              | 9254              | 8/4/2007 20:45   | Open water     | 14.0                  | 13.3                    | --                 | 7.56                               | 193                             |
| chfai6a              | 9279              | 8/20/2007 21:50  | Open water     | 18.4                  | 11.9                    | --                 | 7.43                               | 167                             |
| chfai6a              | 9287              | 9/2/2007 18:21   | Open water     | 20.0                  | 9.54                    | 11.3               | 7.61                               | 239                             |
| chfai6a              | 9390              | 4/12/2008 20:25  | Under ice      | -3.50                 | -0.03                   | 8.63               | 8.25                               | 196                             |
| chfai6a              | 9424              | 6/2/2008 18:51   | Open water     | 24.1                  | 12.3                    | 11.1               | 7.91                               | 180                             |

**Table 22.** Water quality, field measurements, and laboratory analyses – Chena River above Fairbanks.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| chfai6a              | 9437              | 6/16/2008 21:26  | Open water     | 16.8                  | 12.7                    | 10.4               | 7.85                               | 170                             |
| chfai6a              | 9453              | 6/30/2008 20:10  | Open water     | 17.8                  | 12.1                    | --                 | 7.90                               | 174                             |
| chfai6a              | 9701              | 7/14/2008 19:31  | Open water     | 21.6                  | 13.1                    | 13.5               | 7.97                               | 180                             |
| chfai6a              | 9778              | 7/28/2008 19:40  | Open water     | 18.4                  | 10.9                    | 11.3               | 7.84                               | 181                             |
| chfai6a              | 9891              | 8/25/2008 20:30  | Open water     | 17.4                  | 8.48                    | 11.6               | 7.47                               | 172                             |

**Table 22.** Water quality, field measurements, and laboratory analyses – Chena River above Fairbanks.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| chfai6a              | 9160              | 4/17/2007 20:24  | 7.95                          | <0.9                | 22.6                 | 1,075              | 388.8                | 82.70             |
| chfai6a              | 9181              | 5/25/2007 11:00  | 7.77                          | <0.9                | 29.6                 | 1,340              | 441.4                | 89.60             |
| chfai6a              | 9193              | 6/8/2007 17:17   | 7.26                          | 2.9E                | 19.5                 | 863.7              | 301.6                | 61.90             |
| chfai6a              | 9211              | 6/21/2007 17:32  | 7.48                          | <0.9                | 19.0                 | 1,249              | 430.9                | 181.0             |
| chfai6a              | 9227              | 7/6/2007 20:15   | 7.44                          | <0.9                | 22.1                 | 1,338              | 452.9                | 194.2             |
| chfai6a              | 9235              | 7/18/2007 16:40  | 7.68                          | --                  | --                   | --                 | --                   | --                |
| chfai6a              | 9254              | 8/4/2007 20:45   | 7.55                          | <0.9                | 21.9                 | 1,397              | 464.7                | 207.3             |
| chfai6a              | 9279              | 8/20/2007 21:50  | 7.74                          | <0.9                | 23.6                 | 1,228              | 408.0                | 71.50             |
| chfai6a              | 9287              | 9/2/2007 18:21   | 7.52                          | <0.9                | 24.9                 | 1,338              | 351.8                | 72.60             |
| chfai6a              | 9390              | 4/12/2008 20:25  | 8.21                          | 5.3E                | 28.8                 | 1,274              | 423.8                | 98.50             |
| chfai6a              | 9424              | 6/2/2008 18:51   | 7.47                          | <0.9                | 26.9                 | 1,367              | 501.3                | 84.00             |

**Table 22.** Water quality, field measurements, and laboratory analyses – Chena River above Fairbanks.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| chfai6a              | 9437              | 6/16/2008 21:26  | 7.39                          | 1.2E                | 24.0                 | 1,274              | 455.2                | 73.90             |
| chfai6a              | 9453              | 6/30/2008 20:10  | 7.83                          | 0.5E                | 20.8                 | 1,326              | 500.6                | 73.60             |
| chfai6a              | 9701              | 7/14/2008 19:31  | 7.39                          | <0.9                | 19.0                 | 1,384              | 422.7                | 123.2             |
| chfai6a              | 9778              | 7/28/2008 19:40  | 7.50                          | 4.7E                | 27.0                 | 1,450              | 469.7                | 79.40             |
| chfai6a              | 9891              | 8/25/2008 20:30  | 7.40                          | <0.9                | 28.1                 | 1,296              | 426.4                | 80.90             |

**Table 22.** Water quality, field measurements, and laboratory analyses – Chena River above Fairbanks.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| chfai6a              | 9160              | 4/17/2007 20:24  | 1,142                            | 13.6                | 28.9               | 368.7              | 1                        |
| chfai6a              | 9181              | 5/25/2007 11:00  | 1,351                            | 15.7                | 5.70               | 510.8              | 0                        |
| chfai6a              | 9193              | 6/8/2007 17:17   | 776.7                            | 11.4                | 15.5               | 287.5              | 7                        |
| chfai6a              | 9211              | 6/21/2007 17:32  | 1,359                            | 24.3                | 9.60               | 427.7              | 2                        |
| chfai6a              | 9227              | 7/6/2007 20:15   | 1,487                            | 27.7                | 3.70               | 448.3              | 1                        |
| chfai6a              | 9235              | 7/18/2007 16:40  | --                               | --                  | --                 | --                 | --                       |
| chfai6a              | 9254              | 8/4/2007 20:45   | 1,410                            | 24.0                | 8.90               | 628.9              | 0                        |
| chfai6a              | 9279              | 8/20/2007 21:50  | 1,095                            | 9.40                | 21.2               | 607.8              | 0                        |
| chfai6a              | 9287              | 9/2/2007 18:21   | 1,244                            | 8.40                | 18.6               | 512.2              | 0                        |
| chfai6a              | 9390              | 4/12/2008 20:25  | 1,486                            | 19.1                | 7.90               | 379.7              | 1                        |
| chfai6a              | 9424              | 6/2/2008 18:51   | 1,393                            | 13.2                | 26.7               | 508.7              | 3                        |

**Table 22.** Water quality, field measurements, and laboratory analyses – Chena River above Fairbanks.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| chfai6a              | 9437              | 6/16/2008 21:26  | 1,224                            | 10.1                | 30.2               | 476.3              | 0                        |
| chfai6a              | 9453              | 6/30/2008 20:10  | 1,242                            | 11.0                | 11.6               | 505.0              | 1                        |
| chfai6a              | 9701              | 7/14/2008 19:31  | 1,342                            | 11.2                | 10.0               | 497.5              | 2                        |
| chfai6a              | 9778              | 7/28/2008 19:40  | 1,321                            | 12.4                | 11.3               | 563.7              | 3                        |
| chfai6a              | 9891              | 8/25/2008 20:30  | 1,234                            | 6.80                | <0.20              | 650.9              | 2                        |

**Table 22.** Water quality, field measurements, and laboratory analyses – Chena River above Fairbanks.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| chfai6a                 | 9160                 | 4/17/2007 20:24  | 0.046                         | 1.9  | 2.40                                  | 5,845                      | 2,818                                   | 16.8             | -149.3               | -19.21                |
| chfai6a                 | 9181                 | 5/25/2007 11:00  | 0.139                         | 3.3  | 4.20                                  | 1,931                      | 2,317                                   | 23.3             | -152.2               | -19.62                |
| chfai6a                 | 9193                 | 6/8/2007 17:17   | 0.696                         | 3.6  | 19.2                                  | 4,508                      | 1,169                                   | 4.9              | -152.5               | -19.32                |
| chfai6a                 | 9211                 | 6/21/2007 17:32  | 0.206                         | 3.4  | 6.10                                  | 2,785                      | 1,423                                   | 20.2             | -151.2               | -21.25                |
| chfai6a                 | 9227                 | 7/6/2007 20:15   | 0.126                         | 3.3  | 3.90                                  | n/a                        | n/a                                     | n/a              | -150.4               | -19.33                |
| chfai6a                 | 9235                 | 7/18/2007 16:40  | --                            | --   | --                                    | 1,330                      | 1,498                                   | 20.4             | --                   | --                    |
| chfai6a                 | 9254                 | 8/4/2007 20:45   | 0.117                         | 2.9  | 4.00                                  | 867.0                      | 1,570                                   | 19.2             | -150.3               | -19.24                |
| chfai6a                 | 9279                 | 8/20/2007 21:50  | 0.179                         | 3.2  | 5.70                                  | 1,325                      | 1,360                                   | 11.0             | -147.3               | -18.94                |
| chfai6a                 | 9287                 | 9/2/2007 18:21   | 0.117                         | 3.0  | 3.90                                  | 1,590                      | 1,492                                   | 24.5             | -149.1               | -19.21                |
| chfai6a                 | 9390                 | 4/12/2008 20:25  | 0.118                         | 3.9  | 3.00                                  | 6,986                      | 2,330                                   | 80.5             | -150.2               | -19.31                |
| chfai6a                 | 9424                 | 6/2/2008 18:51   | 0.133                         | 3.2  | 4.20                                  | n/a                        | n/a                                     | n/a              | -153.3               | -19.71                |

**Table 22.** Water quality, field measurements, and laboratory analyses – Chena River above Fairbanks.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| chfai6a                 | 9437                 | 6/16/2008 21:26  | 0.209                         | 3.2  | 6.50                                  | 1,739                      | 1,806                                   | 19.6             | -152.9               | -19.55                |
| chfai6a                 | 9453                 | 6/30/2008 20:10  | 0.237                         | 3.4  | 7.00                                  | --                         | --                                      | --               | -150.5               | -19.36                |
| chfai6a                 | 9701                 | 7/14/2008 19:31  | 0.171                         | 3.5  | 4.90                                  | n/a                        | n/a                                     | n/a              | -149.7               | -19.34                |
| chfai6a                 | 9778                 | 7/28/2008 19:40  | 0.144                         | 3.2  | 4.50                                  | n/a                        | n/a                                     | n/a              | -150.3               | -19.35                |
| chfai6a                 | 9891                 | 8/25/2008 20:30  | 0.161                         | 3.3  | 4.80                                  | n/a                        | n/a                                     | n/a              | -152.9               | -18.90                |

**Table 23.** Water quality, field measurements, and laboratory analyses – Chena River Mouth, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million; δ <sup>2</sup> D, deuterium; δ <sup>18</sup> O, oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| chfai1b              | 9013              | 4/17/2006 15:30  | Open water     | --                    | 0.93                    | 10.5               | 7.84                               | 251                             |
| chfai1b              | 9038              | 5/11/2006 11:55  | Open water     | --                    | 2.39                    | 14.9               | 6.84                               | 112                             |
| chfai1b              | 9045              | 5/19/2006 11:45  | Open water     | 13.2                  | 3.89                    | 13.6               | 7.21                               | 103                             |
| chfai1b              | 9064              | 6/1/2006 --      | Open water     | 14.9                  | 9.62                    | 9.54               | 7.49                               | 174                             |
| chfai1b              | 9105              | 7/12/2006 17:00  | Open water     | --                    | 14.1                    | 9.99               | 7.30                               | 156                             |
| chfai1b              | 9117              | 8/8/2006 17:00   | Open water     | 18.3                  | 13.6                    | 10.6               | 7.58                               | 163                             |
| chfai1b              | 9158              | 4/16/2007 12:54  | Under ice      | 18.5                  | 2.70                    | --                 | 7.97                               | 244                             |
| chfai1b              | 9182              | 5/22/2007 13:45  | Open water     | n/a                   | 11.9                    | 7.11               | 7.97                               | 75.0                            |
| chfai1b              | 9185              | 6/5/2007 13:01   | Open water     | 16.8                  | 14.4                    | -0.12              | 7.73                               | 160                             |
| chfai1b              | 9204              | 6/19/2007 15:33  | Open water     | 26.0                  | 14.7                    | 10.4               | 7.82                               | 131                             |
| chfai1b              | 9228              | 7/5/2007 14:25   | Open water     | 26.0                  | 19.1                    | 2.21               | 8.16                               | 183                             |

**Table 23.** Water quality, field measurements, and laboratory analyses – Chena River Mouth, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| chfai1b              | 9237              | 7/18/2007 12:15  | Open water     | 22.0                  | 18.2                    | 10.6               | 7.58                               | 198                             |
| chfai1b              | 9258              | 8/2/2007 16:07   | Open water     | 19.0                  | 16.2                    | --                 | 7.48                               | 167                             |
| chfai1b              | 9277              | 8/20/2007 16:30  | Open water     | 21.8                  | 13.4                    | --                 | 7.58                               | 161                             |
| chfai1b              | 9288              | 9/2/2007 13:59   | Open water     | 19.4                  | 9.64                    | 11.0               | 7.59                               | 198                             |
| chfai1b              | 9391              | 4/12/2008 14:03  | Under ice      | 4.70                  | 1.09                    | 8.47               | 8.50                               | 282                             |
| chfai1b              | 9421              | 6/2/2008 22:11   | Open water     | 19.1                  | 12.4                    | 10.6               | 8.08                               | 203                             |
| chfai1b              | 9431              | 6/16/2008 16:18  | Open water     | 20.6                  | 14.2                    | 9.92               | 7.81                               | 175                             |
| chfai1b              | 9457              | 6/30/2008 15:20  | Open water     | 17.9                  | 13.2                    | 10.5               | 8.11                               | 178                             |
| chfai1b              | 9699              | 7/14/2008 15:31  | Open water     | 20.2                  | 14.7                    | 10.3               | 7.91                               | 188                             |
| chfai1b              | 9776              | 7/28/2008 15:48  | Open water     | 19.4                  | 12.6                    | 11.0               | 8.22                               | 196                             |
| chfai1b              | 9879              | 8/25/2008 15:08  | Open water     | 19.8                  | 8.91                    | 11.4               | 7.71                               | 183                             |
| chfai1b              | 9880              | 8/25/2008 16:05  | Open water     | 16.9                  | 8.64                    | 11.6               | 7.90                               | 185                             |

**Table 23.** Water quality, field measurements, and laboratory analyses – Chena River Mouth, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| chfai1b              | 9013              | 4/17/2006 15:30  | 6.57                          | --                  | --                   | --                 | --                   | --                |
| chfai1b              | 9038              | 5/11/2006 11:55  | 7.15                          | --                  | --                   | --                 | --                   | --                |
| chfai1b              | 9045              | 5/19/2006 11:45  | 7.20                          | <0.9                | 22.4                 | 749.6              | 288.8                | 46.80             |
| chfai1b              | 9064              | 6/1/2006 --      | 6.73                          | <0.9                | 24.2                 | 1,215              | 460.3                | 84.60             |
| chfai1b              | 9105              | 7/12/2006 17:00  | 7.50                          | <0.9                | 20.5                 | 1,164              | 413.9                | 76.10             |
| chfai1b              | 9117              | 8/8/2006 17:00   | 7.52                          | <0.9                | 35.0                 | 1,450              | 527.4                | 115.6             |
| chfai1b              | 9158              | 4/16/2007 12:54  | 7.13                          | <0.9                | 68.4                 | 1,658              | 714.0                | 222.0             |
| chfai1b              | 9182              | 5/22/2007 13:45  | 6.17                          | <0.9                | 25.7                 | 1,412              | 468.3                | 158.4             |
| chfai1b              | 9185              | 6/5/2007 13:01   | 7.51                          | 2.7E                | 34.7                 | 1,412              | 462.7                | 114.9             |
| chfai1b              | 9204              | 6/19/2007 15:33  | 7.41                          | <0.9                | 28.7                 | 1,193              | 424.7                | 96.60             |
| chfai1b              | 9228              | 7/5/2007 14:25   | 7.47                          | <0.9                | 32.3                 | 1,498              | 515.5                | 234.1             |

**Table 23.** Water quality, field measurements, and laboratory analyses – Chena River Mouth, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| chfai1b              | 9237              | 7/18/2007 12:15  | 7.60                          | <0.9                | 28.9                 | 1,374              | 473.9                | 99.70             |
| chfai1b              | 9258              | 8/2/2007 16:07   | 7.42                          | <0.9                | 33.3                 | 1,454              | 539.4                | 120.0             |
| chfai1b              | 9277              | 8/20/2007 16:30  | 7.74                          | --                  | --                   | --                 | --                   | --                |
| chfai1b              | 9288              | 9/2/2007 13:59   | 7.40                          | 2.3E                | 32.3                 | 1,445              | 431.4                | 101.8             |
| chfai1b              | 9391              | 4/12/2008 14:03  | 8.09                          | 21                  | 150                  | 1,833              | 656.4                | 226.2             |
| chfai1b              | 9421              | 6/2/2008 22:11   | 7.25                          | 2.9E                | 37.3                 | 1,510              | 575.8                | 123.9             |
| chfai1b              | 9431              | 6/16/2008 16:18  | 7.46                          | 2.3E                | 29.1                 | 1,333              | 438.3                | 88.6              |
| chfai1b              | 9457              | 6/30/2008 15:20  | 7.4                           | <0.9                | 17.4                 | 1,342              | 521.8                | 219.2             |
| chfai1b              | 9699              | 7/14/2008 15:31  | 7.72                          | <0.9                | 25.4                 | 1,453              | 463.7                | 148.5             |
| chfai1b              | 9776              | 7/28/2008 15:48  | 7.52                          | 5.3E                | 32.4                 | 1,548              | 503.5                | 102.6             |
| chfai1b              | 9879              | 8/25/2008 15:08  | 7.42                          | <0.9                | 36.0                 | 1,358              | 465.4                | 115.2             |
| chfai1b              | 9880              | 8/25/2008 16:05  | 7.37                          | <0.9                | 36.1                 | 1,374              | 465.0                | 111.7             |

**Table 23.** Water quality, field measurements, and laboratory analyses – Chena River Mouth, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>( $\mu\text{eq/L}$ ) | Chloride<br>( $\mu\text{eq/L}$ ) | Nitrate<br>( $\mu\text{eq/L}$ ) | Sulfate<br>( $\mu\text{eq/L}$ ) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|-----------------------------------------------|----------------------------------|---------------------------------|---------------------------------|--------------------------|
| chfai1b              | 9013              | 4/17/2006 15:30  | 2,089                                         | 77.9                             | 10.4                            | 365.8                           | --                       |
| chfai1b              | 9038              | 5/11/2006 11:55  | 735.0                                         | 16.0                             | 16.7                            | 290.8                           | --                       |
| chfai1b              | 9045              | 5/19/2006 11:45  | 700.0                                         | 12.3                             | 16.7                            | 248.8                           | 6                        |
| chfai1b              | 9064              | 6/1/2006 --      | 1,246                                         | 21.6                             | 17.4                            | 384.2                           | 3                        |
| chfai1b              | 9105              | 7/12/2006 17:00  | 1,111                                         | 10.1                             | 19.4                            | 388.6                           | 5                        |
| chfai1b              | 9117              | 8/8/2006 17:00   | 1,531                                         | 35.4                             | 10.3                            | 452.7                           | 2                        |
| chfai1b              | 9158              | 4/16/2007 12:54  | 2,174                                         | 122                              | 17.2                            | 357.2                           | 0                        |
| chfai1b              | 9182              | 5/22/2007 13:45  | 1,532                                         | 56.8                             | 6.90                            | 447.5                           | 1                        |
| chfai1b              | 9185              | 6/5/2007 13:01   | 1,545                                         | 33.0                             | 5.10                            | 426.5                           | 0                        |
| chfai1b              | 9204              | 6/19/2007 15:33  | 1,263                                         | 21.7                             | 13.2                            | 371.5                           | 2                        |
| chfai1b              | 9228              | 7/5/2007 14:25   | 1,801                                         | 53.7                             | 1.4E                            | 391.0                           | 1                        |

**Table 23.** Water quality, field measurements, and laboratory analyses – Chena River Mouth, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| chfailb              | 9237              | 7/18/2007 12:15  | 1,359                            | 22.9                | 9.00               | 544.7              | 1                        |
| chfailb              | 9258              | 8/2/2007 16:07   | 1,509                            | 26.6                | 6.60               | 439.7              | 4                        |
| chfailb              | 9277              | 8/20/2007 16:30  | 1,452                            | 42.3                | 1.60               | 977.0              | --                       |
| chfailb              | 9288              | 9/2/2007 13:59   | 1,429                            | 27.3                | 17.3               | 457.2              | 2                        |
| chfailb              | 9391              | 4/12/2008 14:03  | 2,399                            | 214                 | 7.00               | 297.0              | -1                       |
| chfailb              | 9421              | 6/2/2008 22:11   | 1,656                            | 38.3                | 27.7               | 446.6              | 2                        |
| chfailb              | 9431              | 6/16/2008 16:18  | 1,309                            | 20.5                | 31.9               | 426.6              | 0                        |
| chfailb              | 9457              | 6/30/2008 15:20  | 1,441                            | 48.8                | 12.3               | 459.5              | 4                        |
| chfailb              | 9699              | 7/14/2008 15:31  | 1,451                            | 19.2                | 10.3               | 465.3              | 1                        |
| chfailb              | 9776              | 7/28/2008 15:48  | 1,519                            | 29.1                | 10.6               | 508.5              | 3                        |
| chfailb              | 9879              | 8/25/2008 15:08  | 1,380                            | 24.2                | 23.3               | 564.7              | 3                        |
| chfailb              | 9880              | 8/25/2008 16:05  | 1,381                            | 24.7                | <0.20              | 616.9              | -1                       |

**Table 23.** Water quality, field measurements, and laboratory analyses – Chena River Mouth, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| chfai1b                 | 9013                 | 4/17/2006 15:30  | 0.102                         | 3.3  | 3.10                                  | 5,225                      | 2,871                                   | 52.6             | -154.2               | -19.88                |
| chfai1b                 | 9038                 | 5/11/2006 11:55  | 0.542                         | 3.3  | 16.3                                  | 1,853                      | 843                                     | 9.6              | -163.4               | -21.03                |
| chfai1b                 | 9045                 | 5/19/2006 11:45  | 0.473                         | 3.5  | 13.4                                  | 1,903                      | 842                                     | 7.9              | -162.8               | -21.02                |
| chfai1b                 | 9064                 | 6/1/2006 --      | 0.203                         | 3.7  | 5.40                                  | 3,897                      | 1,607                                   | 36.8             | -154.6               | -20.1                 |
| chfai1b                 | 9105                 | 7/12/2006 17:00  | 0.231                         | 3.5  | 6.70                                  | 3,911                      | 1,347                                   | 14.7             | -149.9               | -19.36                |
| chfai1b                 | 9117                 | 8/8/2006 17:00   | 0.104                         | 2.8  | 3.70                                  | 1,648                      | 1,899                                   | 45.5             | -152.4               | -19.54                |
| chfai1b                 | 9158                 | 4/16/2007 12:54  | 0.066                         | 2.6  | 2.60                                  | 6,420                      | 2,848                                   | 131              | -157.7               | -19.81                |
| chfai1b                 | 9182                 | 5/22/2007 13:45  | 0.199                         | 3.8  | 5.30                                  | 3,215                      | 2,688                                   | 13.3             | -153.6               | -19.67                |
| chfai1b                 | 9185                 | 6/5/2007 13:01   | 0.195                         | 3.5  | 5.60                                  | 3,574                      | 2,629                                   | 32.5             | -152.7               | -19.74                |
| chfai1b                 | 9204                 | 6/19/2007 15:33  | 0.322                         | 3.7  | 8.80                                  | 2,393                      | 1,986                                   | 23.6             | -151.4               | -19.39                |
| chfai1b                 | 9228                 | 7/5/2007 14:25   | 0.177                         | 3.7  | 4.80                                  | --                         | --                                      | --               | -151.5               | -19.57                |

**Table 23.** Water quality, field measurements, and laboratory analyses – Chena River Mouth, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| chfai1b                 | 9237                 | 7/18/2007 12:15  | 0.175                         | 3.5  | 5.00                                  | 2,498                      | 1,653                                   | 34.9             | -150.8             | -19.34                |
| chfai1b                 | 9258                 | 8/2/2007 16:07   | 0.160                         | 3.5  | 4.60                                  | 1,319                      | 1,811                                   | 30.1             | -150.9             | -19.32                |
| chfai1b                 | 9277                 | 8/20/2007 16:30  | 0.071                         | 3.0  | 2.40                                  | 1,956                      | 1,429                                   | 21.9             | -166.3             | -21.62                |
| chfai1b                 | 9288                 | 9/2/2007 13:59   | 0.145                         | 3.5  | 4.20                                  | 2,241                      | 1,734                                   | 49.1             | -149.1             | -19.19                |
| chfai1b                 | 9391                 | 4/12/2008 14:03  | 0.102                         | 3.3  | 3.10                                  | 7,013                      | 3,211                                   | 61.7             | -157.2             | -20.21                |
| chfai1b                 | 9421                 | 6/2/2008 22:11   | 0.542                         | 3.3  | 4.50                                  | --                         | --                                      | --               | -154.7             | -19.82                |
| chfai1b                 | 9431                 | 6/16/2008 16:18  | 0.473                         | 3.5  | 6.90                                  | --                         | 1,884                                   | 22.0             | -153.5             | -19.68                |
| chfai1b                 | 9457                 | 6/30/2008 15:20  | 0.203                         | 3.7  | 6.30                                  | n/a                        | n/a                                     | n/a              | -151.3             | -19.50                |
| chfai1b                 | 9699                 | 7/14/2008 15:31  | 0.231                         | 3.5  | 5.20                                  | n/a                        | n/a                                     | n/a              | -150.5             | -19.40                |
| chfai1b                 | 9776                 | 7/28/2008 15:48  | 0.104                         | 2.8  | 4.80                                  | n/a                        | n/a                                     | n/a              | -152.2             | -19.46                |
| chfai1b                 | 9879                 | 8/25/2008 15:08  | 0.066                         | 2.6  | 5.30                                  | n/a                        | n/a                                     | n/a              | -153.1             | -19.10                |
| chfai1b                 | 9880                 | 8/25/2008 16:05  | 0.199                         | 3.8  | 5.00                                  | n/a                        | n/a                                     | n/a              | -152.8             | -19.10                |

**Table 24.** Water quality, field measurements, and laboratory analyses – Clearwater River, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million; δ <sup>2</sup> D, deuterium; δ <sup>18</sup> O, oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| cld661a              | 9009              | 3/25/2006 13:13  | Under ice      | --                    | 1.81                    | 12.9               | 8.13                               | 289                             |
| cld661a              | 9077              | 6/16/2006 15:30  | Open water     | --                    | 5.63                    | 11.3               | 7.87                               | 320                             |
| cld661a              | 9099              | 7/13/2006 12:30  | Open water     | --                    | 5.48                    | --                 | --                                 | 319                             |
| cld661a              | 9236              | 7/19/2007 21:40  | Open water     | 22.4                  | 7.27                    | 11.2               | 7.86                               | 321                             |
| cld661a              | 9253              | 8/3/2007 18:58   | Open water     | 22.5                  | 7.40                    | --                 | 7.82                               | 211                             |

**Table 24.** Water quality, field measurements, and laboratory analyses – Clearwater River, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units)    | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L)     | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|----------------------|--------------------|--------------------------|-------------------|
| cld661a              | 9009              | 3/25/2006 13:13  | 7.90                             | <0.9                | 59.0                 | 2,297              | 726.3                    | 154.3             |
| cld661a              | 9077              | 6/16/2006 15:30  | 7.70                             | <0.9                | 51.1                 | 2,427              | 751.6                    | 157.9             |
| cld661a              | 9099              | 7/13/2006 12:30  | 7.60                             | --                  | --                   | --                 | --                       | --                |
| cld661a              | 9236              | 7/19/2007 21:40  | 8.01                             | <0.9                | 53.6                 | 2,443              | 590.4                    | 173.0             |
| cld661a              | 9253              | 8/3/2007 18:58   | 7.92                             | <0.9                | 55.3                 | 2,404              | 681.4                    | 174.2             |
| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L)   | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |                   |
| cld661a              | 9009              | 3/25/2006 13:13  | 2,428                            | 42.2                | 20.5                 | 736.2              | 0                        |                   |
| cld661a              | 9077              | 6/16/2006 15:30  | 2,428                            | 33.1                | 14.0                 | 739.9              | 3                        |                   |
| cld661a              | 9099              | 7/13/2006 12:30  | --                               | --                  | --                   | --                 | --                       |                   |
| cld661a              | 9236              | 7/19/2007 21:40  | 2,405                            | 4.80                | 11.6                 | 764.7              | 1                        |                   |
| cld661a              | 9253              | 8/3/2007 18:58   | 2,390                            | 37.5                | 6.40                 | 943.4              | -1                       |                   |

**Table 24.** Water quality, field measurements, and laboratory analyses – Clearwater River, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| cld661a                 | 9009                 | 3/25/2006 13:13  | 0.006                         | 1.2  | 0.50                                  | 2,096                      | 2,921                                   | 3.2              | -171.7               | -22.19                |
| cld661a                 | 9077                 | 6/16/2006 15:30  | 0.009                         | 1.0  | 0.90                                  | 2,709                      | 2,922                                   | 4.7              | -170.1               | -22.15                |
| cld661a                 | 9099                 | 7/13/2006 12:30  | --                            | --   | --                                    | 1,213                      | 2,893                                   | 3.2              | --                   | --                    |
| cld661a                 | 9236                 | 7/19/2007 21:40  | 0.014                         | 1.7  | 0.90                                  | 553.0                      | 2,756                                   | 3.6              | -170.5               | -21.86                |
| cld661a                 | 9253                 | 8/3/2007 18:58   | 0.006                         | 0.9  | 0.70                                  | 1,242                      | 2,760                                   | 3.7              | -170.7               | -22.10                |

**Table 25.** Water quality, field measurements, and laboratory analyses – Hess Creek, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| hefai1a              | 9419              | 6/3/2008 16:22   | Open water     | 24.3                                  | 12.1                                    | 10.2               | 7.72                               | 149                                                 |
| hefai1a              | 9440              | 6/17/2008 16:50  | Open water     | 18.4                                  | 10.9                                    | 10.6               | 7.66                               | 147                                                 |
| hefai1a              | 9462              | 7/1/2008 16:28   | Open water     | 17.3                                  | 9.53                                    | 11.4               | 7.76                               | 115                                                 |
| hefai1a              | 9700              | 7/15/2008 15:27  | Open water     | 28.1                                  | 15.0                                    | 9.49               | 7.57                               | 178                                                 |
| hefai1a              | 9779              | 7/29/2008 15:38  | Open water     | 15.1                                  | 14.8                                    | 9.36               | 8.04                               | 204                                                 |
| hefai1a              | 9887              | 8/26/2008 15:05  | Open water     | 23.6                                  | 9.38                                    | 11.8               | 7.56                               | 224                                                 |
| hefai1a              | 9863              | 9/9/2008 14:30   | Open water     | 11.6                                  | 8.32                                    | 9.99               | --                                 | 218                                                 |

**Table 25.** Water quality, field measurements, and laboratory analyses – Hess Creek, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>( $\mu\text{eq/L}$ ) | Potassium<br>( $\mu\text{eq/L}$ ) | Calcium<br>( $\mu\text{eq/L}$ ) | Magnesium<br>( $\mu\text{eq/L}$ ) | Sodium<br>( $\mu\text{eq/L}$ ) |
|----------------------|-------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------------|-----------------------------------|--------------------------------|
| hefaila              | 9419              | 6/3/2008 16:22   | 7.05                          | <0.9                             | 16.7                              | 1,116                           | 591.5                             | 85.00                          |
| hefaila              | 9440              | 6/17/2008 16:50  | 7.05                          | <0.9                             | 12.2                              | 1,118                           | 572.6                             | 77.10                          |
| hefaila              | 9462              | 7/1/2008 16:28   | 7.39                          | <0.9                             | 6.40                              | 868.1                           | 476.6                             | 214.8                          |
| hefaila              | 9700              | 7/15/2008 15:27  | 7.11                          | <0.9                             | 12.6                              | 1,296                           | 605.9                             | 199.9                          |
| hefaila              | 9779              | 7/29/2008 15:38  | 7.20                          | 3.4E                             | 22.5                              | 1,458                           | 692.3                             | 103.4                          |
| hefaila              | 9887              | 8/26/2008 15:05  | 7.12                          | 0.9E                             | 19.0                              | 1,466                           | 765.6                             | 118.1                          |
| hefaila              | 9863              | 9/9/2008 14:30   | 7.64                          | <0.9                             | 16.5                              | 1,524                           | 784.8                             | 112.8                          |

**Table 25.** Water quality, field measurements, and laboratory analyses – Hess Creek, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| hefaila              | 9419              | 6/3/2008 16:22   | 970.6                            | 18.9                | 26.4               | 522.2              | 8                        |
| hefaila              | 9440              | 6/17/2008 16:50  | 998.3                            | 11.8                | 27.0               | 427.9              | 4                        |
| hefaila              | 9462              | 7/1/2008 16:28   | 848.3                            | 32.0                | 5.40               | 371.8              | 3                        |
| hefaila              | 9700              | 7/15/2008 15:27  | 1,177.8                          | 36.2                | 3.50               | 611.0              | 5                        |
| hefaila              | 9779              | 7/29/2008 15:38  | 1,260.2                          | 18.3                | 1.40E              | 834.4              | 4                        |
| hefaila              | 9887              | 8/26/2008 15:05  | 1,312.1                          | 18.7                | 0.60E              | 804.5              | 1                        |
| hefaila              | 9863              | 9/9/08 14:30     | --                               | 17.5                | 0.40E              | 881.4              | --                       |

**Table 25.** Water quality, field measurements, and laboratory analyses – Hess Creek, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| hefaila                 | 9419                 | 6/3/2008 16:22   | 0.910                         | 3.6  | 25.5                                  | --                         | --                                      | --               | -163.1               | -20.87                |
| hefaila                 | 9440                 | 6/17/2008 16:50  | 1.073                         | 3.5  | 30.3                                  | n/a                        | n/a                                     | n/a              | -155.9               | -20.01                |
| hefaila                 | 9462                 | 7/1/2008 16:28   | 1.140                         | 3.7  | 30.8                                  | 2,280                      | --                                      | 10.2             | -152.4               | -19.82                |
| hefaila                 | 9700                 | 7/15/2008 15:27  | 0.730                         | 3.5  | 21.1                                  | n/a                        | n/a                                     | n/a              | -154.9               | -19.92                |
| hefaila                 | 9779                 | 7/29/2008 15:38  | 0.575                         | 3.4  | 16.8                                  | 258                        | 1,882                                   | 18.7             | -154.2               | -19.76                |
| hefaila                 | 9887                 | 8/26/2008 15:05  | 0.591                         | 3.4  | 17.4                                  | 2,325                      | 1,445                                   | 19.1             | -151.5               | -18.90                |
| hefaila                 | 9863                 | 9/9/08 14:30     | --                            | --   | --                                    | 2,850                      | 1,571                                   | 26.6             | --                   | --                    |

**Table 26.** Water quality, field measurements, and laboratory analyses – Porcupine River above Fort Yukon, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality assurance/quality control section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| pofyula              | 9220              | 7/2/2007 15:21   | Open water     | 26.0                                  | 19.5                                    | 4.96               | 7.9                                | 218                                                 |
| pofyula              | 9402              | 4/17/2008 10:47  | Open water     | 10.0                                  | 8.24                                    | --                 | 8.53                               | 426                                                 |
| pofyula              | 9449              | 6/13/2008 19:00  | Open water     | --                                    | --                                      | --                 | 7.93                               | --                                                  |
| pofyula              | 9464              | 6/24/2008 12:00  | Open water     | 25.5                                  | --                                      | --                 | 8.17                               | 212                                                 |
| pofyula              | 9785              | 7/31/2008 11:35  | Open water     | --                                    | 14.5                                    | --                 | 8.09                               | 186                                                 |
| pofyula              | 9959              | 9/11/2008 16:20  | Open water     | --                                    | 11.5                                    | --                 | 8.20                               | 293                                                 |

**Table 26.** Water quality, field measurements, and laboratory analyses – Porcupine River above Fort Yukon, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units)    | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L)     | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|----------------------|--------------------|--------------------------|-------------------|
| pofyula              | 9220              | 7/2/2007 15:21   | 8.18                             | <0.9                | 18.2                 | 1,911              | 469.0                    | 124.8             |
| pofyula              | 9402              | 4/17/2008 10:47  | 8.45                             | 9.9                 | 36.4                 | 3,451              | 1,226                    | 256.2             |
| pofyula              | 9449              | 6/13/2008 19:00  | 8.16                             | <0.9                | 13.6                 | 1,464              | 447.6                    | 75.90             |
| pofyula              | 9464              | 6/24/2008 12:00  | --                               | 0.6E                | 13.9                 | 1,748              | 548.8                    | 110.8             |
| pofyula              | 9785              | 7/31/200811:35   | 8.06                             | <0.9                | 34.2                 | 1,437              | 543.2                    | 162.4             |
| pofyula              | 9959              | 9/11/2008 16:20  | 8.39                             | <0.9                | 12.3                 | 2,148              | 756.7                    | 183.7             |
| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L)   | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |                   |
| pofyula              | 9220              | 7/2/2007 15:21   | 1,699                            | 40.8                | <0.20                | 619.9              | 3                        |                   |
| pofyula              | 9402              | 4/17/2008 10:47  | 3,626                            | 167                 | 12.1                 | 867.3              | 3                        |                   |
| pofyula              | 9449              | 6/13/2008 19:00  | 1,282                            | 27.4                | 2.90                 | 555.5              | 3                        |                   |
| pofyula              | 9464              | 6/24/2008 12:00  | 1,620                            | 52.1                | 0.20E                | 617.0              | 1                        |                   |
| pofyula              | 9785              | 7/31/200811:35   | 1,241                            | 51.0                | 6.80                 | 968.7              | -2                       |                   |
| pofyula              | 9959              | 9/11/2008 16:20  | 1,979                            | 56.9                | 5.00                 | 869.7              | 3                        |                   |

**Table 26.** Water quality, field measurements, and laboratory analyses – Porcupine River above Fort Yukon, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| pofyula                 | 9220                 | 7/2/2007 15:21   | 0.232                         | 2.9  | 8.00                                  | 2,744                      | 2,021                                   | 4.1              | -167.9               | -10.35                |
| pofyula                 | 9402                 | 4/17/2008 10:47  | 0.076                         | 2.0  | 3.80                                  | 2,209                      | 3,647                                   | 14.9             | -169.0               | -21.64                |
| pofyula                 | 9449                 | 6/13/2008 19:00  | 0.327                         | 3.4  | 9.50                                  | 297                        | 1,849                                   | 3.6              | -176.9               | -22.62                |
| pofyula                 | 9464                 | 6/24/2008 12:00  | 0.262                         | 3.1  | 8.60                                  | 1,184                      | 2,084                                   | 5.6              | -169.4               | -21.73                |
| pofyula                 | 9785                 | 7/31/2008 11:35  | 0.511                         | 3.3  | 15.7                                  | n/a                        | n/a                                     | n/a              | -163.7               | -21.05                |
| pofyula                 | 9959                 | 9/11/2008 16:20  | 0.210                         | 3.0  | 7.10                                  | 803                        | 2,516                                   | 8.8              | -165.3               | -20.40                |

**Table 27.** Water quality, field measurements, and laboratory analyses – Yukon River at Fort Yukon, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million; δ <sup>2</sup> D, deuterium; δ <sup>18</sup> O, oxygen-18; E, Estimated; n/a, not available, no sample collected; \*, probable cause of poor ion balance; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yufyula              | 9046              | 5/18/2006 10:15  | Open water     | 7.00                  | 3.80                    | 13.0               | 7.44                               | 150                             |
| yufyula              | 9058              | 5/25/2006 16:30  | Open water     | 22.7                  | 10.9                    | 10.8               | 7.51                               | 114                             |
| yufyula              | 9075              | 6/15/2006 14:45  | Open water     | 26.7                  | 16.9                    | 9.50               | 7.76                               | 181                             |
| yufyula              | 9134              | 10/4/2006 13:15  | Open water     | 12.3                  | 6.90                    | 11.4               | 7.98                               | 162                             |
| yufyula              | 9229              | 7/2/2007 14:43   | Open water     | 26.0                  | 18.3                    | 5.96               | 8.13                               | 188                             |
| yufyula              | 9399              | 4/17/2008 13:33  | Under ice      | 10.0                  | 4.10                    | --                 | 8.08                               | 309                             |
| yufyula              | 9451              | 6/13/2008 18:30  | Open water     | 24.4                  | 15.1                    | --                 | 7.98                               | 206                             |
| yufyula              | 9461              | 6/24/2008 11:30  | Open water     | 19.7                  | 8.21                    | --                 | 8.08                               | 207                             |
| yufyula              | 9784              | 7/31/2008 11:55  | Open water     | --                    | 13.1                    | --                 | 8.23                               | 213                             |
| yufyula              | 9960              | 9/11/2008 16:45  | Open water     | --                    | 11.5                    | --                 | 8.08                               | 243                             |

**Table 27.** Water quality, field measurements, and laboratory analyses – Yukon River at Fort Yukon, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yufyu1a              | 9046              | 5/18/2006 10:15  | 7.48                          | <0.9                | 27.9                 | 1,159              | 485.5                | 79.90             |
| yufyu1a              | 9058              | 5/25/2006 16:30  | 7.53                          | 1.0E                | 23.1                 | 1,227              | 512.8                | 75.20             |
| yufyu1a              | 9075              | 6/15/2006 14:45  | 7.81                          | <0.9                | 19.0                 | 1,461              | 731.2                | 86.00             |
| yufyu1a              | 9134              | 10/4/2006 13:15  | 7.87                          | <0.9                | 22.1                 | 1,767              | 880.0                | 121.8             |
| yufyu1a              | 9229              | 7/2/2007 14:43   | 8.09                          | 1.5E                | 28.3                 | 1,507              | 618.5                | 123.1             |
| yufyu1a              | 9399              | 4/17/2008 13:33  | 8.41                          | 8.2                 | 1384.4*              | 2,402              | 702.9                | 253.1             |
| yufyu1a              | 9451              | 6/13/2008 18:30  | 8.35                          | <0.9                | 21.2                 | 1,488              | 752.2                | 96.70             |
| yufyu1a              | 9461              | 6/24/2008 11:30  | 8.34                          | 1.3E                | 121                  | 1,526              | 705.4                | 113.3             |
| yufyu1a              | 9784              | 7/31/2008 11:55  | 8.28                          | <0.9                | 18.9                 | 1,556              | 744.4                | 199.8             |
| yufyu1a              | 9960              | 9/11/2008 16:45  | 8.38                          | <0.9                | 22.3                 | 1,719              | 808.0                | 143.1             |

**Table 27.** Water quality, field measurements, and laboratory analyses – Yukon River at Fort Yukon, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| yufyula              | 9046              | 5/18/2006 10:15  | 1,090                            | 15.1                | 3.80               | 425.4              | 7                        |
| yufyula              | 9058              | 5/25/2006 16:30  | 1,213                            | 12.9                | 3.40               | 455.5              | 4                        |
| yufyula              | 9075              | 6/15/2006 14:45  | 1,476                            | 11.4                | 3.60               | 688.7              | 3                        |
| yufyula              | 9134              | 10/4/2006 13:15  | 1,693                            | 16.9                | 4.10               | 928.0              | 3                        |
| yufyula              | 9229              | 7/2/2007 14:43   | 1,548                            | 1.50E               | 123                | 28.30              | 1                        |
| yufyula              | 9399              | 4/17/2008 13:33  | 1,239                            | 1,353.2*            | 1.90               | 748.8              | 17                       |
| yufyula              | 9451              | 6/13/2008 18:30  | 1,465                            | 15.7                | 2.80               | 735.1              | 3                        |
| yufyula              | 9461              | 6/24/2008 11:30  | 1,527                            | 138                 | 2.9.               | 754.0              | 1                        |
| yufyula              | 9784              | 7/31/2008 11:55  | 1,559                            | 31.6                | 5.1                | 716.0              | 4                        |
| yufyula              | 9960              | 9/11/2008 16:45  | 1,687                            | 46.9                | 4.0                | 801.2              | 3                        |

**Table 27.** Water quality, field measurements, and laboratory analyses – Yukon River at Fort Yukon, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| yufyula                 | 9046                 | 5/18/2006 10:15  | 0.65                          | 3.4  | 19                                    | 1,496                      | 1,254                                   | 4.1              | -173.3               | -22.20                |
| yufyula                 | 9058                 | 5/25/2006 16:30  | 0.541                         | 3.4  | 16                                    | 2,633                      | 1,381                                   | 3.0              | -171.8               | -22.11                |
| yufyula                 | 9075                 | 6/15/2006 14:45  | 0.113                         | 2.7  | 4.3                                   | 5,590                      | 1,779                                   | 3.2              | -163.9               | -21.15                |
| yufyula                 | 9134                 | 10/4/2006 13:15  | 0.085                         | 2.1  | 4.0                                   | 1,013                      | 2,030                                   | 3.2              | -159.9               | -20.48                |
| yufyula                 | 9229                 | 7/2/2007 14:43   | 0.117                         | 3.0  | 4.0                                   | 1,334                      | 1,759                                   | 3.2              | -166.2               | -21.28                |
| yufyula                 | 9399                 | 4/17/2008 13:33  | 0.038                         | 1.6  | 2.4                                   | 331                        | 2,794                                   | 48.2             | -162.8               | -20.85                |
| yufyula                 | 9451                 | 6/13/2008 18:30  | 0.154                         | 2.5  | 6.1                                   | 1,032                      | 1,978                                   | 3.7              | -166.2               | -21.22                |
| yufyula                 | 9461                 | 6/24/2008 11:30  | 0.148                         | 3.4  | 4.4                                   | 1,919                      | 2,072                                   | 6.3              | -166.9               | -21.41                |
| yufyula                 | 9784                 | 7/31/2008 11:55  | 0.229                         | 3.4  | 6.7                                   | n/a                        | n/a                                     | n/a              | -165.2               | -20.93                |
| yufyula                 | 9960                 | 9/11/2008 16:45  | 0.152                         | 3.3  | 4.6                                   | 1,193                      | 2,200                                   | 6.7              | -165.2               | -20.20                |

**Table 28.** Water quality, field measurements, and laboratory analyses – Chandalar above Venetie, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| chveela              | 9178              | 5/21/2007 12:30  | Open water     | 18.0                                  | 9.00                                    | --                 | 8.26                               | 338                                                 |
| chveela              | 9195              | 6/11/2007 17:00  | Open water     | 23.9                                  | 14.3                                    | --                 | 8.16                               | 258                                                 |
| chveela              | 9221              | 7/2/2007 13:00   | Open water     | 21.1                                  | 16.1                                    | --                 | 8.25                               | 328                                                 |
| chveela              | 9248              | 7/24/2007 13:45  | Open water     | 26.1                                  | 12.7                                    | --                 | 7.78                               | 353                                                 |
| chveela              | 9270              | 8/15/2007 15:45  | Open water     | 19.4                                  | 14.8                                    | --                 | 8.09                               | n/a                                                 |
| chveela              | 9403              | 5/8/2008 10:02   | Under ice      | 9.2                                   | 1.00                                    | --                 | 8.32                               | 290                                                 |
| chveela              | 9417              | 6/5/2008 9:00    | Open water     | 11.4                                  | 10.2                                    | --                 | 8.36                               | 182                                                 |
| chveela              | 9693              | 7/10/2008 13:00  | Open water     | 24.4                                  | 17.9                                    | --                 | 8.20                               | 353                                                 |
| chveela              | 9876              | 8/25/2008 9:00   | Open water     | 20.8                                  | 11.9                                    | --                 | 8.23                               | 401                                                 |

**Table 28.** Water quality, field measurements, and laboratory analyses – Chandalar above Venetie, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| chvee1a              | 9178              | 5/21/2007 12:30  | 7.98                          | <0.9                | 13.7                 | 3,232              | 626.8                | 62.60             |
| chvee1a              | 9195              | 6/11/2007 17:00  | 8.02                          | 1.0E                | 5.70                 | 2,352              | 643.9                | 69.80             |
| chvee1a              | 9221              | 7/2/2007 13:00   | 8.10                          | <0.9                | 13.9                 | 3,090              | 675.7                | 63.00             |
| chvee1a              | 9248              | 7/24/2007 13:45  | 8.14                          | 1.7E                | 18.0                 | 3,114              | 672.9                | 75.40             |
| chvee1a              | 9270              | 8/15/2007 15:45  | 7.88                          | <0.9                | 82.2                 | 3,075              | 841.8                | 118.0             |
| chvee1a              | 9403              | 5/8/2008 10:02   | 8.14                          | 8.8E                | 10.0                 | 2,447              | 676.6                | 176.7             |
| chvee1a              | 9417              | 6/5/2008 9:00    | 7.95                          | <0.9                | 10.8                 | 1,756              | 605.7                | 221.8             |
| chvee1a              | 9693              | 7/10/2008 13:00  | 8.39                          | <0.9                | 7.90                 | 2,871              | 914.6                | 152.2             |
| chvee1a              | 9876              | 8/25/2008 9:00   | 8.22                          | <0.9                | 15.0                 | 3,305              | 1104                 | 100.3             |

**Table 28.** Water quality, field measurements, and laboratory analyses – Chandalar above Venetie, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>( $\mu\text{eq/L}$ ) | Chloride<br>( $\mu\text{eq/L}$ ) | Nitrate<br>( $\mu\text{eq/L}$ ) | Sulfate<br>( $\mu\text{eq/L}$ ) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|-----------------------------------------------|----------------------------------|---------------------------------|---------------------------------|--------------------------|
| chveela              | 9178              | 5/21/2007 12:30  | 2,834                                         | 6.20                             | 12.2                            | 1,055                           | 0                        |
| chveela              | 9195              | 6/11/2007 17:00  | 1,982                                         | 9.50                             | 7.90                            | 999.4                           | 1                        |
| chveela              | 9221              | 7/2/2007 13:00   | 2,692                                         | 5.70                             | 10.0                            | 1,082                           | 1                        |
| chveela              | 9248              | 7/24/2007 13:45  | 2,550                                         | 3.30                             | 9.70                            | 1,213                           | 1                        |
| chveela              | 9270              | 8/15/2007 15:45  | 2,480                                         | 3.00                             | 9.80                            | 1,575                           | 1                        |
| chveela              | 9403              | 5/8/2008 10:02   | 2,271                                         | 30.7                             | 12.9                            | 1,037                           | 1                        |
| chveela              | 9417              | 6/5/2008 9:00    | 1,520                                         | 25.6                             | 23.9                            | 909.8                           | 4                        |
| chveela              | 9693              | 7/10/2008 13:00  | 1,972                                         | 14.1                             | 8.10                            | 1,980                           | 10                       |
| chveela              | 9876              | 8/25/2008 9:00   | 2,447                                         | 5.60                             | 10.9                            | 1,817                           | 5                        |

**Table 28.** Water quality, field measurements, and laboratory analyses – Chandalar above Venetie, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| chveela                 | 9178                 | 5/21/2007 12:30  | 0.015                         | 1.3  | 1.10                                  | 1,555                      | 4,639                                   | 4.2              | -172.9             | -22.14                |
| chveela                 | 9195                 | 6/11/2007 17:00  | 0.071                         | 2.5  | 2.90                                  | 2,927                      | 3,388                                   | 5.3              | -176.3             | -22.7                 |
| chveela                 | 9221                 | 7/2/2007 13:00   | 0.017                         | 1.5  | 1.20                                  | 3,991                      | 2,821                                   | 4.2              | -174.6             | -21.4                 |
| chveela                 | 9248                 | 7/24/2007 13:45  | 0.075                         | 3.7  | 2.10                                  | 1,127                      | 2,499                                   | 4.7              | -173.2             | -22.14                |
| chveela                 | 9270                 | 8/15/2007 15:45  | 0.038                         | 2.1  | 1.80                                  | 2,517                      | 2,570                                   | 4.1              | -170.0             | -21.85                |
| chveela                 | 9403                 | 5/8/2008 10:02   | 0.088                         | 2.4  | 3.70                                  | 1,395                      | 2,610                                   | 15.6             | -176.3             | -22.48                |
| chveela                 | 9417                 | 6/5/2008 9:00    | 0.211                         | 3.4  | 6.20                                  | 903                        | 1,611                                   | 3.7              | -185.9             | -23.68                |
| chveela                 | 9693                 | 7/10/2008 13:00  | 0.048                         | 2.3  | 2.10                                  | n/a                        | n/a                                     | n/a              | -175.8             | -22.46                |
| chveela                 | 9876                 | 8/25/2008 9:00   | 0.029                         | 1.7  | 1.70                                  | n/a                        | n/a                                     | n/a              | -176.7             | -21.90                |

**Table 29.** Water quality, field measurements, and laboratory analyses – Yukon River at Bridge, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million; δ <sup>2</sup> D, deuterium; δ <sup>18</sup> O, oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yubri1a              | 9011              | 3/24/2006 13:15  | Under ice      | -0.60                 | -0.19                   | 9.33               | 8.07                               | 275                             |
| yubri1a              | 9043              | 5/17/2006 13:30  | Open water     | 19.8                  | 1.64                    | 13.3               | 7.52                               | 152                             |
| yubri1a              | 9057              | 5/28/2006 --     | Open water     | 20.5                  | 10.4                    | --                 | --                                 | 146                             |
| yubri1a              | 9069              | 6/10/2006 6:15   | Open water     | --                    | 12.8                    | --                 | 7.58                               | 170                             |
| yubri1a              | 9106              | 7/19/2006 14:30  | Open water     | --                    | 15.6                    | --                 | 7.69                               | 244                             |
| yubri1a              | 9161              | 4/14/2007 15:06  | Under ice      | 6.70                  | 0.30                    | --                 | 8.09                               | 305                             |
| yubri1a              | 9179              | 5/28/2007 16:31  | Open water     | 17.1                  | 14.7                    | 6.99               | 7.82                               | 108                             |
| yubri1a              | 9196              | 6/11/2007 15:17  | Open water     | 24.8                  | 16.2                    | 10.8               | 7.81                               | 147                             |
| yubri1a              | 9215              | 6/25/2007 15:17  | Open water     | 25.0                  | 17.7                    | 10.1               | 8.31                               | 185                             |
| yubri1a              | 9230              | 7/9/2007 17:27   | Open water     | 30.0                  | 20.1                    | 8.99               | 7.63                               | 233                             |

**Table 29.** Water quality, field measurements, and laboratory analyses – Yukon River at Bridge, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yubri1a              | 9240              | 7/22/2007 14:32  | Open water     | 28.9                  | 19.7                    | 9.49               | 7.59                               | 206                             |
| yubri1a              | 9242              | 7/22/2007 14:32  | Open water     | 28.9                  | 19.7                    | 9.49               | 7.70                               | 206                             |
| yubri1a              | 9256              | 8/7/2007 8:55    | Open water     | 13.8                  | 17.3                    | --                 | 7.72                               | 215                             |
| yubri1a              | 9284              | 9/1/2007 16:10   | Open water     | 28.7                  | 14.6                    | 10.1               | 7.75                               | 245                             |
| yubri1a              | 9395              | 4/13/2008 15:00  | Under ice      | 0.30                  | -0.04                   | 6.81               | 8.48                               | 272                             |
| yubri1a              | 9423              | 6/3/2008 13:58   | Open water     | 24.3                  | 6.99                    | 10.4               | 7.96                               | 177                             |
| yubri1a              | 9436              | 6/17/2008 15:09  | Open water     | 16.0                  | 15.5                    | 9.82               | 8.04                               | 210                             |
| yubri1a              | 9456              | 7/1/2008 14:55   | Open water     | 24.4                  | 16.4                    | 10.3               | 8.33                               | 224                             |
| yubri1a              | 9692              | 7/15/2008 13:48  | Open water     | 25.1                  | 16.9                    | 9.75               | 8.16                               | 212                             |
| yubri1a              | 9777              | 7/29/2008 13:55  | Open water     | 18.3                  | 15.5                    | 10.7               | 7.77                               | 220                             |
| yubri1a              | 9894              | 8/26/2008 12:45  | Open water     | 22.3                  | 11.8                    | 11.9               | 8.06                               | 232                             |
| yubri1a              | 9866              | 9/9/2008 13:15   | Open water     | 13.7                  | 10.4                    | 11.3               | --                                 | 206                             |

**Table 29.** Water quality, field measurements, and laboratory analyses – Yukon River at Bridge, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yubri1a              | 9011              | 3/24/2006 13:15  | 7.41                          | <0.9                | 28.1                 | 2,084              | 842.6                | 111.7             |
| yubri1a              | 9043              | 5/17/2006 13:30  | 7.72                          | <0.9                | 19.5                 | 1,122              | 437.6                | 136.9             |
| yubri1a              | 9057              | 5/28/2006 --     | 7.89                          | --                  | --                   | --                 | --                   | --                |
| yubri1a              | 9069              | 6/10/2006 6:15   | 8.19                          | <0.9                | 20.1                 | 1,380              | 609.7                | 83.30             |
| yubri1a              | 9106              | 7/19/2006 14:30  | 8.15                          | <0.9                | 33.5                 | 1,610              | 732.7                | 121.1             |
| yubri1a              | 9161              | 4/14/2007 15:06  | 7.81                          | <0.9                | 27.1                 | 204                | 768.3                | 132.7             |
| yubri1a              | 9179              | 5/28/2007 16:31  | 7.86                          | 1.1E                | 74.7                 | 1,317              | 451.5                | 97.80             |
| yubri1a              | 9196              | 6/11/2007 15:17  | 7.69                          | <0.9                | 50.0                 | 1,328              | 482.0                | 77.50             |
| yubri1a              | 9215              | 6/25/2007 15:17  | 7.91                          | <0.9                | 44.8                 | 1,507              | 597.3                | 212.0             |
| yubri1a              | 9230              | 7/9/2007 17:27   | 8.08                          | <0.9                | 22.9                 | 1,532              | 652.7                | 172.4             |

**Table 29.** Water quality, field measurements, and laboratory analyses – Yukon River at Bridge, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yubri1a              | 9240              | 7/22/2007 14:32  | 7.92                          | <0.9                | 31.7                 | 1,602              | 554.5                | 110.4             |
| yubri1a              | 9242              | 7/22/2007 14:32  | 7.92                          | <0.9                | 26.9                 | 1,604              | 595.3                | 121.4             |
| yubri1a              | 9256              | 8/7/2007 8:55    | 8.15                          | <0.9                | 28.4                 | 1,700              | 585.6                | 264.1             |
| yubri1a              | 9395              | 4/13/2008 15:00  | 8.02                          | 17                  | 28.4                 | 2,037              | 735.6                | 134.5             |
| yubri1a              | 9423              | 6/3/2008 13:58   | 7.98                          | <0.9                | 24.2                 | 1,397              | 529.6                | 110.3             |
| yubri1a              | 9436              | 6/17/2008 15:09  | 7.49                          | 1.1E                | 22.2                 | 1,554              | 647.4                | 86.30             |
| yubri1a              | 9456              | 7/1/2008 14:55   | 7.58                          | <0.9                | 19.3                 | 1,584              | 680.8                | 226.9             |
| yubri1a              | 9692              | 7/15/2008 13:48  | 7.83                          | <0.9                | 21.8                 | 1,550              | 541.7                | 221.2             |
| yubri1a              | 9777              | 7/29/2008 13:55  | 7.79                          | 3.0E                | 29.3                 | 1,677              | 637.8                | 107.2             |
| yubri1a              | 9894              | 8/26/2008 12:45  | 7.70                          | <0.9                | 32.1                 | 1,658              | 725.3                | 115.7             |
| yubri1a              | 9866              | 9/9/2008 13:15   | 7.62                          | --                  | --                   | --                 | --                   | --                |

**Table 29.** Water quality, field measurements, and laboratory analyses – Yukon River at Bridge, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>( $\mu\text{eq/L}$ ) | Chloride<br>( $\mu\text{eq/L}$ ) | Nitrate<br>( $\mu\text{eq/L}$ ) | Sulfate<br>( $\mu\text{eq/L}$ ) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|-----------------------------------------------|----------------------------------|---------------------------------|---------------------------------|--------------------------|
| yubri1a              | 9011              | 3/24/2006 13:15  | 2,280                                         | 28.2                             | 7.30                            | 746.6                           | 0                        |
| yubri1a              | 9043              | 5/17/2006 13:30  | 1,110                                         | 52.1                             | 5.30                            | 340.8                           | 6                        |
| yubri1a              | 9057              | 5/28/2006 --     | --                                            | --                               | --                              | --                              | --                       |
| yubri1a              | 9069              | 6/10/2006 6:15   | 1,336                                         | 17.2                             | 4.00                            | 556.6                           | 4                        |
| yubri1a              | 9106              | 7/19/2006 14:30  | 1,549                                         | 14.1                             | 3.10                            | 756.2                           | 4                        |
| yubri1a              | 9161              | 4/14/2007 15:06  | 2,242                                         | 26.6                             | 7.10                            | 840.3                           | -2                       |
| yubri1a              | 9179              | 5/28/2007 16:31  | 1,294                                         | 69.7                             | 2.30                            | 466.5                           | 3                        |
| yubri1a              | 9196              | 6/11/2007 15:17  | 1,306                                         | 42.2                             | 3.30                            | 506.7                           | 2                        |
| yubri1a              | 9215              | 6/25/2007 15:17  | 1,578                                         | 55.7                             | 2.70                            | 651.5                           | 2                        |
| yubri1a              | 9230              | 7/9/2007 17:27   | 1,459                                         | 28.3                             | 3.70                            | 961.5                           | -1                       |

**Table 29.** Water quality, field measurements, and laboratory analyses – Yukon River at Bridge, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| yubri1a              | 9240              | 7/22/2007 14:32  | 1,491                            | 18.2                | 2.40               | 746.9              | 1                        |
| yubri1a              | 9242              | 7/22/2007 14:32  | 1,489                            | 20.4                | 2.70               | 739.2              | 2                        |
| yubri1a              | 9256              | 8/7/2007 8:55    | 1,624                            | 1.90E               | 2.40               | 874.4              | 1                        |
| yubri1a              | 9395              | 4/13/2008 15:00  | 2,274                            | 23.8                | 2.80               | 823.4              | -1                       |
| yubri1a              | 9423              | 6/3/2008 13:58   | 1,318                            | 25.7                | 6.80               | 691.8              | 4                        |
| yubri1a              | 9436              | 6/17/2008 15:09  | 1,427                            | 29.6                | 22.9               | 522.8              | 3                        |
| yubri1a              | 9456              | 7/1/2008 14:55   | 1,577                            | 14.3                | 23.0               | 699.6              | 1                        |
| yubri1a              | 9692              | 7/15/2008 13:48  | 1,508                            | 42.4                | 2.80               | 822.7              | 1                        |
| yubri1a              | 9777              | 7/29/2008 13:55  | 1,462                            | 13.3                | 7.30               | 770.0              | 3                        |
| yubri1a              | 9894              | 8/26/2008 12:45  | 1,559                            | 15.4                | 6.00               | 783.7              | 3                        |
| yubri1a              | 9866              | 9/9/2008 13:15   | --                               | 33.7                | 4.20               | 807.0              | --                       |

**Table 29.** Water quality, field measurements, and laboratory analyses – Yukon River at Bridge, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| yubri1a                 | 9011                 | 3/24/2006 13:15  | 0.039                         | 1.9  | 2.00                                  | 2,700                      | 2,879                                   | 7.0              | -160.3             | -20.58                |
| yubri1a                 | 9043                 | 5/17/2006 13:30  | 0.618                         | 3.1  | 19.8                                  | 1,480                      | 1,233                                   | 9.7              | -173.9             | -22.41                |
| yubri1a                 | 9057                 | 5/28/2006 --     | --                            | --   | --                                    | --                         | 1,225                                   | 5.8              | --                 | --                    |
| yubri1a                 | 9069                 | 6/10/2006 6:15   | 0.277                         | 3.4  | 8.20                                  | --                         | 964.0                                   | --               | -169.7             | -21.96                |
| yubri1a                 | 9106                 | 7/19/2006 14:30  | 0.114                         | 2.3  | 5.10                                  | 1,189                      | 1,822                                   | 4.1              | -163.8             | -21.07                |
| yubri1a                 | 9161                 | 4/14/2007 15:06  | 0.165                         | 4.2  | 4.00                                  | 2,678                      | 2,641                                   | 10.4             | -159.2             | -20.45                |
| yubri1a                 | 9179                 | 5/28/2007 16:31  | 0.437                         | 3.1  | 14.2                                  | 1,978                      | 2,045                                   | 3.8              | -177.8             | -22.76                |
| yubri1a                 | 9196                 | 6/11/2007 15:17  | 0.252                         | 3.1  | 8.20                                  | 1,293                      | 1,997                                   | 4.3              | -173.4             | -22.18                |
| yubri1a                 | 9215                 | 6/25/2007 15:17  | 0.151                         | 3.2  | 4.80                                  | 1,034                      | 1,632                                   | 3.8              | -165.9             | -20.61                |
| yubri1a                 | 9230                 | 7/9/2007 17:27   | 0.159                         | 3.4  | 4.70                                  | 952                        | 1,719                                   | 4.1              | -163.4             | -21.17                |

**Table 29.** Water quality, field measurements, and laboratory analyses – Yukon River at Bridge, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| yubрила                 | 9240                 | 7/22/2007 14:32  | 0.156                         | 2.9  | 5.40                                  | 1,109                      | 1,698                                   | 4.7              | -164.2             | -20.86                |
| yubрила                 | 9242                 | 7/22/2007 14:32  | 0.152                         | 2.8  | 5.50                                  | 655                        | 1,730                                   | 5.4              | -163.3             | -20.93                |
| yubрила                 | 9256                 | 8/7/2007 8:55    | 0.093                         | 2.6  | 3.60                                  | 670                        | 1,821                                   | 3.1              | -163.8             | -20.98                |
| yubрила                 | 9284                 | 9/1/2007 16:10   | 0.118                         | 2.9  | 4.10                                  | 714.0                      | 1,874                                   | 6.2              | -160.9             | -20.74                |
| yubрила                 | 9395                 | 4/13/2008 15:00  | 0.045                         | 2.0  | 2.20                                  | 1,978                      | 2,815                                   | 17.8             | -160.7             | -20.58                |
| yubрила                 | 9423                 | 6/3/2008 13:58   | 0.388                         | 3.6  | 10.80                                 | --                         | --                                      | --               | -175.9             | -22.53                |
| yubрила                 | 9436                 | 6/17/2008 15:09  | 0.200                         | 3.2  | 6.30                                  | 2,311                      | 1,999                                   | 4.5              | -169.1             | -21.48                |
| yubрила                 | 9456                 | 7/1/2008 14:55   | 0.163                         | 3.2  | 5.10                                  | 1,809                      | 1,952                                   | 4.9              | -166.9             | -21.45                |
| yubрила                 | 9692                 | 7/15/2008 13:48  | 0.282                         | 3.0  | 9.40                                  | 715                        | 1,871                                   | 3.6              | -165.5             | -21.31                |
| yubрила                 | 9777                 | 7/29/2008 13:55  | 0.293                         | 3.5  | 8.50                                  | 1,064                      | 2,053                                   | 3.5              | -166.0             | -21.03                |
| yubрила                 | 9894                 | 8/26/2008 12:45  | 0.218                         | 3.1  | 6.90                                  | 1,156                      | 1,730                                   | 7.6              | -165.9             | -20.10                |
| yubрила                 | 9866                 | 9/9/2008 13:15   | 0.235                         | 3.5  | 6.70                                  | 1,246                      | 1,815                                   | 9.1              | -167.0             | -21.00                |

**Table 30.** Water quality, field measurements, and laboratory analyses – Yukon River at Ruby, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; \*, probable cause of poor ion balance; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yurby1a              | 9076              | 6/14/2006 13:30  | Open water     | --                    | 18.1                    | 8.30               | 7.53                               | --                              |
| yurby1a              | 9085              | 6/28/2006 17:50  | Open water     | --                    | 16.4                    | 9.46               | 7.61                               | 203                             |
| yurby1a              | 9183              | 5/23/2007 9:00   | Open water     | 14.4                  | 13.0                    | --                 | 7.98                               | --                              |
| yurby1a              | 9184              | 6/6/2007 11:00   | Open water     | 20.5                  | 17.0                    | --                 | 7.57                               | --                              |
| yurby1a              | 9206              | 6/21/2007 10:30  | Open water     | 17.2                  | 18.4                    | --                 | 8.09                               | 202                             |
| yurby1a              | 9243              | 7/18/2007 9:30   | Open water     | 16.0                  | 18.5                    | --                 | 7.65                               | 219                             |
| yurby1a              | 9251              | 7/31/2007 10:00  | Open water     | 12.0                  | 19.3                    | --                 | 7.52                               | 230                             |
| yurby1a              | 9268              | 8/14/2007 14:30  | Open water     | 15.0                  | 16.9                    | --                 | 7.57                               | 227                             |
| yurby1a              | 9286              | 8/29/2007 10:00  | Open water     | 10.0                  | 15.5                    | --                 | 7.66                               | 234                             |
| yurby1a              | 9689              | 7/14/2008 10:14  | Open water     | 9.00                  | 18.5                    | --                 | 8.16                               | 243                             |
| yurby1a              | 9877              | 8/27/2008 9:50   | Open water     | 4.00                  | 11.8                    | --                 | 8.12                               | 248                             |

**Table 30.** Water quality, field measurements, and laboratory analyses – Yukon River at Ruby, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yurby1a              | 9076              | 6/14/2006 13:30  | 7.10                          | <0.9                | 32.7                 | 1,504              | 646.9                | 106.4             |
| yurby1a              | 9085              | 6/28/2006 17:50  | 7.96                          | <0.9                | 36.9                 | 1,584              | 694.6                | 105.6             |
| yurby1a              | 9183              | 5/23/2007 9:00   | 6.97                          | <0.9                | 36.0                 | 1,479              | 531.8                | 119.0             |
| yurby1a              | 9184              | 6/6/2007 11:00   | 6.73                          | <0.9                | 28.3                 | 1,411              | 443.5                | 103.1             |
| yurby1a              | 9206              | 6/21/2007 10:30  | 7.90                          | <0.9                | 29.1                 | 1,503              | 547.0                | 155.1             |
| yurby1a              | 9243              | 7/18/2007 9:30   | 7.70                          | <0.9                | 21.2                 | 1,486              | 441.8                | 273.8             |
| yurby1a              | 9251              | 7/31/2007 10:00  | 7.60                          | 3.2E                | 41.0                 | 1,661              | 592.7                | 207.6             |
| yurby1a              | 9268              | 8/14/2007 14:30  | 7.69                          | <0.9                | 37.9                 | 1,617              | 654.4                | 346.4             |
| yurby1a              | 9286              | 8/29/2007 10:00  | 7.73                          | <0.9                | 22.4                 | 1,705              | 598.6                | 231.1             |
| yurby1a              | 9689              | 7/14/2008 10:14  | 7.68                          | <0.9                | 28.2                 | 1,747              | 610.8                | 242.1             |
| yurby1a              | 9877              | 8/27/2008 9:50   | 7.10                          | <0.9                | 29.0                 | 1,799              | 756.4                | 208.6             |

**Table 30.** Water quality, field measurements, and laboratory analyses – Yukon River at Ruby, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| yurbyla              | 9076              | 6/14/2006 13:30  | 1,494                            | 32.0                | 6.00               | 617.7              | 3                        |
| yurbyla              | 9085              | 6/28/2006 17:50  | 1,446                            | 15.9                | 6.80               | 797.6              | 3                        |
| yurbyla              | 9183              | 5/23/2007 9:00   | 1,478                            | 31.3                | 5.30               | 528.4              | 3                        |
| yurbyla              | 9184              | 6/6/2007 11:00   | 709.6*                           | 22.9                | 4.70               | 490.8              | 24                       |
| yurbyla              | 9206              | 6/21/2007 10:30  | 1,462                            | 48.8                | 5.00               | 644.3              | 2                        |
| yurbyla              | 9243              | 7/18/2007 9:30   | 1,474                            | 59.7                | 5.00               | 705.8              | 0                        |
| yurbyla              | 9251              | 7/31/2007 10:00  | 1,522                            | 58.1                | 4.60               | 806.2              | 2                        |
| yurbyla              | 9268              | 8/14/2007 14:30  | 1,591                            | 54.3                | 6.80               | 829.4              | 3                        |
| yurbyla              | 9286              | 8/29/2007 10:00  | 1,592                            | 75.2                | 5.60               | 815.3              | 1                        |
| yurbyla              | 9689              | 7/14/2008 10:14  | 1,649                            | 20.0                | 7.50               | 918.8              | 1                        |
| yurbyla              | 9877              | 8/27/2008 9:50   | 1,684                            | 35.2                | 5.80               | 853.9              | 4                        |

**Table 30.** Water quality, field measurements, and laboratory analyses – Yukon River at Ruby, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| yurby1a                 | 9076                 | 6/14/2006 13:30  | 0.255                         | 3.3  | 7.60                                  | 1,883                      | 1,695                                   | 7.8              | -170.8             | -22.26                |
| yurby1a                 | 9085                 | 6/28/2006 17:50  | 0.114                         | 2.6  | 4.40                                  | 923                        | 1,708                                   | 5.3              | -167.0             | -21.59                |
| yurby1a                 | 9183                 | 5/23/2007 9:00   | 0.498                         | 3.5  | 14.4                                  | 1,807                      | 2,549                                   | 6.1              | -167.4             | -21.36                |
| yurby1a                 | 9184                 | 6/6/2007 11:00   | 0.371                         | 3.8  | 9.90                                  | 2,623                      | 2,383                                   | 6.1              | -174.8             | -22.43                |
| yurby1a                 | 9206                 | 6/21/2007 10:30  | 0.210                         | 3.5  | 6.10                                  | 1,375                      | 1,628                                   | 3.9              | -164.9             | -21.45                |
| yurby1a                 | 9243                 | 7/18/2007 9:30   | 0.263                         | 3.9  | 6.80                                  | 1,268                      | 1,662                                   | 5.0              | -159.6             | -20.61                |
| yurby1a                 | 9251                 | 7/31/2007 10:00  | 0.140                         | 2.6  | 5.50                                  | 885                        | 1,743                                   | 5.1              | -163.5             | -21.06                |
| yurby1a                 | 9268                 | 8/14/2007 14:30  | 0.243                         | 3.4  | 7.20                                  | 941                        | 1,803                                   | 4.4              | -158.8             | -20.38                |
| yurby1a                 | 9286                 | 8/29/2007 10:00  | 0.172                         | 3.2  | 5.40                                  | 1,192                      | 1,835                                   | 5.0              | -158.1             | -20.65                |
| yurby1a                 | 9689                 | 7/14/2008 10:14  | 0.173                         | 2.6  | 6.60                                  | 665                        | 2,120                                   | 4.3              | -164.8             | -21.02                |
| yurby1a                 | 9877                 | 8/27/2008 9:50   | 0.217                         | 3.5  | 6.10                                  | --                         | 1,896                                   | 9.1              | --                 | --                    |

**Table 31.** Water quality, field measurements, and laboratory analyses – Yukon River at Galena, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| yugalla              | 9468              | 7/1/2008 13:10   | Open water     | 25.9                                  | 17.8                                    | 9.36               | 7.94                               | 185                                                 |
| yugalla              | 9696              | 7/14/2008 15:00  | Open water     | 17.7                                  | 18.3                                    | 9.02               | 8.11                               | 195                                                 |
| yugalla              | 9875              | 8/25/2008 19:00  | Open water     | 16.6                                  | 13.8                                    | 9.76               | 8.12                               | 181                                                 |
| yugalla              | 9913              | 8/11/2008 17:00  | Open water     | 22.4                                  | 14.5                                    | 9.80               | 7.98                               | 178                                                 |
| yugalla              | 9988              | 9/15/2008 17:40  | Open water     | 10.6                                  | 10.7                                    | 10.9               | 8.10                               | 178                                                 |

**Table 31.** Water quality, field measurements, and laboratory analyses – Yukon River at Galena, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units)    | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L)     | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|----------------------|--------------------|--------------------------|-------------------|
| yugalla              | 9468              | 7/1/2008 13:10   | 8.01                             | <0.9                | 26.8                 | 1,574              | 657.7                    | 121.1             |
| yugalla              | 9696              | 7/14/2008 15:00  | 8.26                             | <0.9                | 28.2                 | 1,664              | 604.3                    | 115.5             |
| yugalla              | 9875              | 8/25/2008 19:00  | 8.10                             | <0.9                | 25.2                 | 1,677              | 699.4                    | 235.5             |
| yugalla              | 9913              | 8/11/2008 17:00  | 8.06                             | <0.9                | 22.6                 | 1,628              | 675.1                    | 157.0             |
| yugalla              | 9988              | 9/15/2008 17:40  | 8.07                             | <0.9                | 31.7                 | 1,788              | 740.3                    | 173.5             |
| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L)   | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |                   |
| yugalla              | 9468              | 7/1/2008 13:10   | 1,489                            | 26.9                | 4.90                 | 784.1              | 2                        |                   |
| yugalla              | 9696              | 7/14/2008 15:00  | 1,540                            | 10.3                | 5.60                 | 837.8              | 0                        |                   |
| yugalla              | 9875              | 8/25/2008 19:00  | 1,602                            | 36.4                | 6.50                 | 791.8              | 4                        |                   |
| yugalla              | 9913              | 8/11/2008 17:00  | 1,500                            | 31.8                | 8.70                 | 761.2              | 4                        |                   |
| yugalla              | 9988              | 9/15/2008 17:40  | 1,741                            | 46.7                | 7.60                 | 858.1              | 1                        |                   |

**Table 31.** Water quality, field measurements, and laboratory analyses – Yukon River at Galena, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| yugalla                 | 9468                 | 7/1/2008 13:10   | 0.182                         | 3.1  | 5.90                                  | 1,940                      | 1,960                                   | 6.6              | -164.4               | -21.12                |
| yugalla                 | 9696                 | 7/14/2008 15:00  | 0.168                         | 3.1  | 5.40                                  | 985                        | 2,014                                   | 3.9              | -163.9               | -20.99                |
| yugalla                 | 9875                 | 8/25/2008 19:00  | 0.249                         | 3.6  | 7.00                                  | n/a                        | n/a                                     | n/a              | -163.8               | -19.10                |
| yugalla                 | 9913                 | 8/11/2008 17:00  | 0.235                         | 3.4  | 7.00                                  | n/a                        | n/a                                     | n/a              | -164.4               | -20.60                |
| yugalla                 | 9988                 | 9/15/2008 17:40  | 0.187                         | 3.2  | 5.90                                  | 987                        | 2,280                                   | 6.3              | -164.9               | -20.40                |

**Table 32.** Water quality, field measurements, and laboratory analyses – Koyukuk River above Husila, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| kohsl1a              | 9034              | 4/20/2006 16:19  | Under ice      | 0                                     | -0.2                                    | --                 | 6.98                               | 340                                                 |
| kohsl1a              | 9054              | 5/24/2006 15:15  | Open water     | 30                                    | 5.3                                     | --                 | 7.14                               | 88.2                                                |
| kohsl1a              | 9083              | 6/22/2006 14:20  | Open water     | 20                                    | 14.9                                    | 97.2               | 7.26                               | --                                                  |
| kohsl1a              | 9112              | 7/24/2006        | Open water     | 15.6                                  | 20.9                                    | --                 | 7.23                               | 97.6                                                |
| kohsl1a              | 9140              | 10/19/2006 10:07 | Open water     | -1.0                                  | -0.2                                    | --                 | 7.60                               | --                                                  |
| kohsl1a              | 9162              | 4/10/2007 14:15  | Under ice      | 6.11                                  | 1.50                                    | 0.36               | 7.83                               | --                                                  |
| kohsl1a              | 9174              | 5/23/2007 16:55  | Open water     | 7.22                                  | 10.0                                    | 7.13               | 7.75                               | --                                                  |
| kohsl1a              | 9194              | 6/6/2007 16:40   | Open water     | 21.7                                  | 16.4                                    | --                 | 7.85                               | --                                                  |
| kohsl1a              | 9231              | 6/23/2007 23:45  | Open water     | 7.22                                  | 17.0                                    | --                 | 7.20                               | --                                                  |
| kohsl1a              | 9266              | 8/7/2007 --      | Open water     | 11.1                                  | 7.04                                    | --                 | 7.75                               | 296                                                 |
| kohsl1a              | 9272              | 8/11/2007 17:00  | Open water     | 22.2                                  | 14.4                                    | --                 | --                                 | 473                                                 |

**Table 32.** Water quality, field measurements, and laboratory analyses – Koyukuk River above Husila, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| kohs11a              | 9034              | 4/20/2006 16:19  | 6.33                          | --                  | --                   | --                 | --                   | --                |
| kohs11a              | 9054              | 5/24/2006 15:15  | 6.77                          | 0.9E                | 16.2                 | 834.1              | 427.4                | 37.60             |
| kohs11a              | 9083              | 6/22/2006 14:20  | 7.33                          | <0.9                | 6.4                  | 1,582              | 1,075                | 110.9             |
| kohs11a              | 9112              | 7/24/2006 --     | 7.16                          | <0.9                | 7.9                  | 1,567              | 1,047                | 84.00             |
| kohs11a              | 9140              | 10/19/2006 10:07 | 7.32                          | <0.9                | 6.2                  | 1,838              | 1,302                | 107.3             |
| kohs11a              | 9162              | 4/10/2007 14:15  | 6.67                          | <0.9                | 18.6                 | 3,037              | 923.9                | 135.4             |
| kohs11a              | 9174              | 5/23/2007 16:55  | 6.99                          | 1.7E                | 18.4                 | 1,366              | 586.6                | 92.20             |
| kohs11a              | 9194              | 6/6/2007 16:40   | 8.08                          | <0.9                | 12.4                 | 1,584              | 860.4                | 81.40             |
| kohs11a              | 9231              | 6/23/2007 23:45  | 7.91                          | <0.9                | 12.5                 | 1,866              | 1,058                | 115.3             |
| kohs11a              | 9266              | 8/7/2007 --      | 8.10                          | <0.9                | 15.8                 | 2,945              | 1,343                | 162.8             |
| kohs11a              | 9272              | 8/11/2007 17:00  | 7.99                          | <0.9                | 12.2                 | 2,738              | 1,410                | 257.9             |

**Table 32.** Water quality, field measurements, and laboratory analyses – Koyukuk River above Husila, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| kohsl1a              | 9034              | 4/20/2006 16:19  | 3,078                            | 14.8                | 10.7               | 492.3              | --                       |
| kohsl1a              | 9054              | 5/24/2006 15:15  | 698                              | 9.3                 | 4.1                | 439.8              | 7                        |
| kohsl1a              | 9083              | 6/22/2006 14:20  | 1,174                            | 18.4                | 6.7                | 1,395              | 3                        |
| kohsl1a              | 9112              | 7/24/2006 --     | 1,113                            | 0.8                 | 8.2                | 1,380              | 4                        |
| kohsl1a              | 9140              | 10/19/2006 10:07 | 1,458                            | 17.4                | 15.2               | 1,624              | 2                        |
| kohsl1a              | 9162              | 4/10/2007 14:15  | 3,562                            | 21.7                | 35.1               | 617.0              | -1                       |
| kohsl1a              | 9174              | 5/23/2007 16:55  | 1,362                            | 14.9                | 5.50               | 623.9              | 1                        |
| kohsl1a              | 9194              | 6/6/2007 16:40   | 1,243                            | 7.70                | 6.00               | 1,285              | 0                        |
| kohsl1a              | 9231              | 6/23/2007 23:45  | 1,071                            | 10.9                | 4.70               | 1,755              | 4                        |
| kohsl1a              | 9266              | 8/7/2007 --      | 1,811                            | 6.90                | 7.30               | 1,659              | 12                       |
| kohsl1a              | 9272              | 8/11/2007 17:00  | --                               | 17.1                | 6.30               | 1,421              | --                       |

**Table 32.** Water quality, field measurements, and laboratory analyses – Koyukuk River above Husila, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| kohs11a                 | 9034                 | 4/20/2006 16:19  | 0.182                         | 4.3  | 4.20                                  | 12,469                     | 4,664                                   | 809              | -145.63            | -18.8                 |
| kohs11a                 | 9054                 | 5/24/2006 15:15  | 0.6                           | 3.7  | 16.1                                  | 2,753                      | 934                                     | 6.1              | -168.54            | -21.92                |
| kohs11a                 | 9083                 | 6/22/2006 14:20  | 0.14                          | 3.5  | 4.00                                  | 1,577                      | 1,400                                   | 5.3              | -164.2             | -21.41                |
| kohs11a                 | 9112                 | 7/24/2006        | 0.287                         | 3.7  | 7.70                                  | 1,459                      | 1,344                                   | 4.6              | -149.03            | -19.43                |
| kohs11a                 | 9140                 | 10/19/2006 10:07 | 0.368                         | 3.8  | 9.6                                   | 1,280                      | 1,652                                   | 17.7             | -149.13            | -19.24                |
| kohs11a                 | 9162                 | 4/10/2007 14:15  | 0.070                         | 2.1  | 3.30                                  | 14,308                     | 5,101                                   | 1,647            | -170.5             | -21.86                |
| kohs11a                 | 9174                 | 5/23/2007 16:55  | 0.358                         | 3.8  | 9.40                                  | 1,242                      | 2,760                                   | 3.7              | -170.7             | -22.10                |
| kohs11a                 | 9194                 | 6/6/2007 16:40   | 0.148                         | 3.3  | 4.40                                  | 2,232                      | 2,025                                   | 5.3              | -146.0             | -18.80                |
| kohs11a                 | 9231                 | 6/23/2007 23:45  | 0.260                         | 3.4  | 7.60                                  | 2,330                      | 2,369                                   | 16.2             | -153.0             | -19.88                |
| kohs11a                 | 9266                 | 8/7/2007 00:05   | 0.104                         | 2.8  | 3.70                                  | 2,232                      | 2,025                                   | 5.3              | -167.1             | -21.64                |
| kohs11a                 | 9272                 | 8/11/2007 17:00  | 0.154                         | 3.1  | 5.00                                  | 1,651                      | 1,677                                   | 9.7              | -152.8             | -19.72                |

**Table 33.** Water quality, field measurements, and laboratory analyses – Koyukuk River above Husila site 2, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality assurance/quality control section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| kohsl2a              | 9175              | 5/23/2007 13:50  | Open water     | 10.0                                  | 11.3                                    | 7.09               | 8.05                               | --                                                  |
| kohsl2a              | 9199              | 6/6/2007 15:15   | Open water     | 18.33                                 | 16.8                                    | --                 | 7.87                               | 127                                                 |
| kohsl2a              | 9232              | 6/21/2007 21:02  | Open water     | 10.0                                  | 17.4                                    | --                 | 7.55                               | --                                                  |
| kohsl2a              | 9265              | 8/6/2007 22:55   | Open water     | 12.8                                  | 5.20                                    | --                 | --                                 | 287                                                 |
| kohsl2a              | 9271              | 8/11/2007 15:30  | Open water     | 22.2                                  | 15.1                                    | --                 | 7.73                               | 473                                                 |
| kohsl2a              | 9362              | 9/23/2007 14:25  | Open water     | --                                    | 7.9                                     | --                 | --                                 | 490                                                 |

**Table 33.** Water quality, field measurements, and laboratory analyses – Koyukuk River above Husila site 2, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units)    | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L)     | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|----------------------|--------------------|--------------------------|-------------------|
| kohsl2a              | 9175              | 5/23/2007 13:50  | 7.34                             | <0.9                | 17.9                 | 1,673              | 715.6                    | 90.90             |
| kohsl2a              | 9199              | 6/6/2007 15:15   | 8.11                             | <0.9                | 12.4                 | 1,671              | 996.2                    | 88.60             |
| kohsl2a              | 9232              | 6/21/2007 21:02  | 7.96                             | <0.9                | 12.5                 | 1,954              | 1,140                    | 111.9             |
| kohsl2a              | 9265              | 8/6/2007 22:55   | 8.12                             | --                  | --                   | --                 | --                       | --                |
| kohsl2a              | 9271              | 8/11/2007 15:30  | 7.98                             | <0.9                | 12.3                 | 2,852              | 1,459                    | 286.1             |
| kohsl2a              | 9362              | 9/23/2007 14:25  | 8.22                             | <0.9                | 15.3                 | 3,296              | 1,519                    | 176.4             |
| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L)   | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |                   |
| kohsl2a              | 9175              | 5/23/2007 13:50  | 1,610                            | 11.6                | 5.00                 | 819.1              | 1                        |                   |
| kohsl2a              | 9199              | 6/6/2007 15:15   | 1,301                            | 7.80                | 5.50                 | 1,435              | 0                        |                   |
| kohsl2a              | 9232              | 6/21/2007 21:02  | 1,525                            | 10.9                | 3.90                 | 1,887              | -3                       |                   |
| kohsl2a              | 9265              | 8/6/2007 22:55   | --                               | --                  | --                   | --                 | --                       |                   |
| kohsl2a              | 9271              | 8/11/2007 15:30  | 2,410                            | 16.4                | 7.50                 | 1,775              | 5                        |                   |
| kohsl2a              | 9362              | 9/23/2007 14:25  | --                               | 8.90                | 10.0                 | 3,434              | --                       |                   |

**Table 33.** Water quality, field measurements, and laboratory analyses – Koyukuk River above Husila site 2, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| kohsl2a                 | 9175                 | 5/23/2007 13:50  | 0.287                         | 3.5  | 8.10                                  | 2,646                      | 2,947                                   | 16.9             | -157.2               | -20.16                |
| kohsl2a                 | 9199                 | 6/6/2007 15:15   | 0.125                         | 3.2  | 3.90                                  | 1,539                      | 2,199                                   | 4.4              | -169.0               | -21.89                |
| kohsl2a                 | 9232                 | 6/21/2007 21:02  | 0.234                         | 2.9  | 8.00                                  | 1,458                      | 1,720                                   | 8.7              | -154.9               | -19.81                |
| kohsl2a                 | 9265                 | 8/6/2007 22:55   | --                            | --   | --                                    | 844                        | 2,164                                   | 5.7              | --                   | --                    |
| kohsl2a                 | 9271                 | 8/11/2007 15:30  | 0.155                         | 3.0  | 5.20                                  | 208                        | 1,926                                   | 3.7              | -154.7               | -19.85                |
| kohsl2a                 | 9362                 | 9/23/2007 14:25  | 0.098                         | 3.9  | 11.6                                  | 269                        | 2,097                                   | 7.9              | --                   | --                    |

**Table 34.** Water quality, field measurements, and laboratory analyses – Koyukuk River at mouth, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| kokyula              | 9246              | 7/21/2007 16:17  | Open water     | --                                    | 20.9                                    | --                 | 7.67                               | 324                                                 |
| kokyula              | 9250              | 7/21/2007 21:33  | Open water     | --                                    | 19.7                                    | 9.57               | 7.60                               | 309                                                 |
| kokyula              | 9465              | 7/1/2008 10:15   | Open water     | 18.1                                  | 17.8                                    | 8.66               | 7.87                               | 280                                                 |
| kokyula              | 9691              | 7/14/2008 17:10  | Open water     | 18.8                                  | 18.5                                    | --                 | 8.18                               | 339                                                 |
| kokyula              | 9874              | 8/25/2008 16:00  | Open water     | --                                    | 14.3                                    | 10.0               | 8.18                               | 382                                                 |
| kokyula              | 9911              | 8/11/2008 12:30  | Open water     | 18.7                                  | 13.9                                    | 10.16              | 7.96                               | 295                                                 |
| kokyula              | 9990              | 9/15/2008 15:00  | Open water     | 13.0                                  | 9.60                                    | 10.34              | 8.35                               | 289                                                 |

**Table 34.** Water quality, field measurements, and laboratory analyses – Koyukuk River at mouth, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| kokyula              | 9246              | 7/21/2007 16:17  | 8.00                          | 11.3                | 18.9                 | 2,043              | 799.3                | 167.0             |
| kokyula              | 9250              | 7/21/2007 21:33  | 8.00                          | 2.3E                | 15.2                 | 2,210              | 1,279                | 181.9             |
| kokyula              | 9465              | 7/1/2008 10:15   | 7.76                          | <0.9                | 12.2                 | 1,841              | 1,183                | 111.0             |
| kokyula              | 9691              | 7/14/2008 17:10  | 8.23                          | <0.9                | 11.1                 | 2,365              | 1,295                | 180.6             |
| kokyula              | 9874              | 8/25/2008 16:00  | 8.16                          | <0.9                | 12.9                 | 2,603              | 1,592                | 277.4             |
| kokyula              | 9911              | 8/11/2008 12:30  | 8.11                          | <0.9                | 18.4                 | 2,416              | 1,553                | 198.5             |
| kokyula              | 9990              | 9/15/2008 15:00  | 8.55                          | <0.9                | 20.2                 | 2,865              | 1,611                | 162.2             |

**Table 34.** Water quality, field measurements, and laboratory analyses – Koyukuk River at mouth, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>( $\mu\text{eq/L}$ ) | Chloride<br>( $\mu\text{eq/L}$ ) | Nitrate<br>( $\mu\text{eq/L}$ ) | Sulfate<br>( $\mu\text{eq/L}$ ) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|-----------------------------------------------|----------------------------------|---------------------------------|---------------------------------|--------------------------|
| kokyula              | 9246              | 7/21/2007 16:17  | 1,800                                         | 35.2                             | 3.30                            | 1,223                           | 0                        |
| kokyula              | 9250              | 7/21/2007 21:33  | 1,917                                         | 27.7                             | 2.30                            | 1,537                           | 3                        |
| kokyula              | 9465              | 7/1/2008 10:15   | 1,359                                         | 12.0                             | 7.80                            | 1,696                           | 1                        |
| kokyula              | 9691              | 7/14/2008 17:10  | 1,745                                         | 14.2                             | 0.80                            | 1,981                           | 3                        |
| kokyula              | 9874              | 8/25/2008 16:00  | 1,920                                         | 29.4                             | 4.20                            | 2,329                           | 1                        |
| kokyula              | 9911              | 8/11/2008 12:30  | 3,137                                         | 30.1                             | 9.10                            | 2,240                           | -13                      |
| kokyula              | 9990              | 9/15/2008 15:00  | 2,404                                         | 14.8                             | 6.90                            | 2,003                           | 2                        |

**Table 34.** Water quality, field measurements, and laboratory analyses – Koyukuk River at mouth, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| kokyula                 | 9246                 | 7/21/2007 16:17  | 0.208                         | 2.8  | 7.60                                  | 3,313                      | 2,077                                   | 9.0              | -153.0               | -19.58                |
| kokyula                 | 9250                 | 7/21/2007 21:33  | 0.222                         | 3.0  | 7.40                                  | 1,798                      | 2,233                                   | 4.9              | -148.4               | -18.90                |
| kokyula                 | 9465                 | 7/1/2008 10:15   | 0.194                         | 3.4  | 5.60                                  | 3,646                      | 1,856                                   | 8.2              | -155.3               | -20.56                |
| kokyula                 | 9691                 | 7/14/2008 17:10  | 0.164                         | 3.1  | 5.30                                  | n/a                        | n/a                                     | n/a              | -157.1               | -20.14                |
| kokyula                 | 9874                 | 8/25/2008 16:00  | 0.172                         | 3.0  | 5.8                                   | n/a                        | n/a                                     | n/a              | -153.4               | -19.10                |
| kokyula                 | 9911                 | 8/11/2008 12:30  | 0.185                         | 2.9  | 6.3                                   | n/a                        | n/a                                     | n/a              | -152.7               | -18.50                |
| kokyula                 | 9990                 | 9/15/2008 15:00  | 0.134                         | 2.8  | 4.8                                   | 1,862                      | 3,055                                   | 9.7              | -152.2               | -19.10                |

**Table 35.** Water quality, field measurements, and laboratory analyses – Hog River, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type                | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|-------------------------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| hohsl1a              | 9081              | 6/21/2006 8:15   | Open water                    | 22.0                  | 14.9                    | --                 | 7.22                               | n/a                             |
| hohsl1a              | 9113              | 7/24/2006 15:30  | Open water                    | 18.3                  | 15.6                    | --                 | 6.97                               | 90.2                            |
| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L)   | Potassium<br>(µeq/L)    | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L)               | Sodium<br>(µeq/L)               |
| hohsl1a              | 9081              | 6/21/2006 8:15   | 6.45                          | <0.9                  | 6.20                    | 575.1              | 266.6                              | 83.90                           |
| hohsl1a              | 9113              | 7/24/2006 15:30  | 6.18                          | <0.9                  | 4.40                    | 524.9              | 242.6                              | 71.10                           |

**Table 35.** Water quality, field measurements, and laboratory analyses – Hog River, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) |  | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |  |
|----------------------|-------------------|------------------|----------------------------------|--|---------------------|--------------------|--------------------|--------------------------|--|
| hohsl1a              | 9081              | 6/21/2006 8:15   | 770.0                            |  | 6.50                | 4.00               | 70.00              | 5                        |  |
| hohsl1a              | 9113              | 7/24/2006 15:30  | 656.0                            |  | 1.50                | 7.00               | 58.20              | 8                        |  |

  

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | δ <sup>2</sup> D | δ <sup>18</sup> O |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|------------------|-------------------|
| hohsl1a                 | 9081                 | 6/21/2006 8:15   | 0.390                         | 4.2  | 9.30                                  | --                         | 1,028                                   | 25.2             | -141.9           | -18.54            |
| hohsl1a                 | 9113                 | 7/24/2006 15:30  | 0.552                         | 4.2  | 13.1                                  | --                         | 861                                     | 29.7             | -137.6           | -18.02            |

**Table 36.** Water quality, field measurements, and laboratory analyses – Anvik River, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; \*, probable cause of poor ion balance; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| ananv1a              | 9079              | 6/18/2006 21:37  | Open water     | 16.0                                  | 11.2                                    | 12.0               | 7.07                               | 58.3                                                |
| ananv1a              | 9100              | 7/12/2006 11:04  | Open water     | 21.0                                  | 15.3                                    | 9.00               | 6.87                               | 105                                                 |
| ananv1a              | 9119              | 8/23/2006 20:25  | Open water     | 13.0                                  | 8.90                                    | 9.00               | 7.24                               | 111                                                 |
| ananv1a              | 9173              | 5/23/2007 17:00  | Open water     | 22.0                                  | 9.00                                    | --                 | 7.40                               | 81.8                                                |
| ananv1a              | 9197              | 6/6/2007 21:30   | Open water     | 21.0                                  | 10.0                                    | --                 | 7.90                               | 89.1                                                |
| ananv1a              | 9213              | 6/20/2007 22:40  | Open water     | 18.0                                  | 16.6                                    | 8.00               | 7.62                               | 205                                                 |

**Table 36.** Water quality, field measurements, and laboratory analyses – Anvik River, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units)    | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L)     | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|----------------------|--------------------|--------------------------|-------------------|
| ananv1a              | 9079              | 6/18/2006 21:37  | 7.40                             | <0.9                | 7.80                 | 451.8              | 236.6                    | 115.2             |
| ananv1a              | 9100              | 7/12/2006 11:04  | 7.51                             | <0.9                | 9.50                 | 601.3              | 316.4                    | 162.7             |
| ananv1a              | 9119              | 8/23/2006 20:25  | 7.47                             | <0.9                | 9.40                 | 639.7              | 348.5                    | 173.4             |
| ananv1a              | 9173              | 5/23/2007 17:00  | 6.84                             | <0.9                | 14.2                 | 475.8              | 224.4                    | 120.0             |
| ananv1a              | 9197              | 6/6/2007 21:30   | 7.18                             | <0.9                | 8.80                 | 515.0              | 232.2                    | 129.7             |
| ananv1a              | 9213              | 6/20/2007 22:40  | 7.78                             | <0.9                | 11.3                 | 634.5              | 312.6                    | 156.9             |
| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L)   | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |                   |
| ananv1a              | 9079              | 6/18/2006 21:37  | 632.0                            | 20.7                | 7.10                 | 119.5              | 2                        |                   |
| ananv1a              | 9100              | 7/12/2006 11:04  | 864.0                            | 14.1                | 5.20                 | 150.6              | 3                        |                   |
| ananv1a              | 9119              | 8/23/2006 20:25  | 921.0                            | 21.4                | 2.10                 | 173.3              | 2                        |                   |
| ananv1a              | 9173              | 5/23/2007 17:00  | 656.1                            | 27.9                | 15.8                 | 126.9              | 0                        |                   |
| ananv1a              | 9197              | 6/6/2007 21:30   | 1,416*                           | 19.4                | 7.10                 | 136.3              | -28                      |                   |
| ananv1a              | 9213              | 6/20/2007 22:40  | 909.4                            | 20.4                | 7.10                 | 840.3              | 1                        |                   |

**Table 36.** Water quality, field measurements, and laboratory analyses – Anvik River, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| ananv1a                 | 9079                 | 6/18/2006 21:37  | 0.116                         | 3.4  | 3.4                                   | --                         | 867                                     | 11.2             | -120.5               | -16.32                |
| ananv1a                 | 9100                 | 7/12/2006 11:04  | 0.135                         | 3.3  | 4.1                                   | 1,791                      | 1,055                                   | 18.3             | -119.4               | -16.05                |
| ananv1a                 | 9119                 | 8/23/2006 20:25  | 0.165                         | 3.3  | 5.1                                   | 1,218                      | 1,104                                   | 21.6             | -117.9               | -15.78                |
| ananv1a                 | 9173                 | 5/23/2007 17:00  | 0.114                         | 3.7  | 3.1                                   | 1,389                      | 1,135                                   | 11.5             | -123.0               | -16.50                |
| ananv1a                 | 9197                 | 6/6/2007 21:30   | 0.132                         | 3.9  | 3.4                                   | 2,287                      | 1,293                                   | 15.3             | -122.4               | -16.29                |
| ananv1a                 | 9213                 | 6/20/2007 22:40  | 0.175                         | 4.0  | 4.4                                   | 2,209                      | 1,070                                   | 21.5             | --                   | -21.01                |

**Table 37.** Water quality, field measurements, and laboratory analyses – Yukon River at Anvik River, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| yuanv1a              | 9008              | 3/18/2006 16:35  | Under ice      | -16.0                                 | 0.60                                    | --                 | 7.77                               | 376                                                 |
| yuanv1a              | 9036              | 5/4/2006 10:20   | Under ice      | 5.00                                  | 0.00                                    | --                 | 7.26                               | 169                                                 |
| yuanv1a              | 9061              | 6/5/2006 10:50   | Open water     | 11.0                                  | 11.1                                    | 6.00               | 7.47                               | 167                                                 |
| yuanv1a              | 9078              | 6/18/2006 20:30  | Open water     | 13.0                                  | 15.5                                    | 7.00               | 7.58                               | 208                                                 |
| yuanv1a              | 9104              | 7/12/2006 10:00  | Open water     | 17.0                                  | 16.9                                    | 8.00               | 7.57                               | 225                                                 |
| yuanv1a              | 9118              | 8/23/2006 22:05  | Open water     | 14.0                                  | 13.5                                    | 11.0               | 7.66                               | 262                                                 |
| yuanv1a              | 9164              | 4/22/2007 17:35  | Under ice      | 1.60                                  | 0.10                                    | --                 | 8.31                               | 318                                                 |
| yuanv1a              | 9176              | 5/23/2007 18:00  | Open water     | 19.0                                  | 8.90                                    | --                 | 7.95                               | 198                                                 |
| yuanv1a              | 9192              | 6/6/2007 19:30   | Open water     | 20.0                                  | 14.5                                    | --                 | 8.01                               | 199                                                 |
| yuanv1a              | 9212              | 6/20/2007 21:30  | Open water     | 18.0                                  | 16.6                                    | 8.00               | 7.90                               | 205                                                 |

**Table 37.** Water quality, field measurements, and laboratory analyses – Yukon River at Anvik River, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yuanv1a              | 9008              | 3/18/2006 16:35  | 7.76                          | 3.0E                | 36.2                 | 2,337              | 888.5                | 136.1             |
| yuanv1a              | 9036              | 5/4/2006 10:20   | 7.20                          | --                  | --                   | --                 | --                   | --                |
| yuanv1a              | 9061              | 6/5/2006 10:50   | 7.85                          | <0.9                | 25.1                 | 1,286              | 440.8                | 64.90             |
| yuanv1a              | 9078              | 6/18/2006 20:30  | 7.80                          | <0.9                | 28.6                 | 1,476              | 616.7                | 96.10             |
| yuanv1a              | 9104              | 7/12/2006 10:00  | 7.98                          | <0.9                | 29.0                 | 1,561              | 682.4                | 102.5             |
| yuanv1a              | 9118              | 8/23/2006 22:05  | 8.01                          | <0.9                | 36.7                 | 1,816              | 831.6                | 137.8             |
| yuanv1a              | 9164              | 4/22/2007 17:35  | 7.25                          | <0.9                | 33.7                 | 2,432              | 866.7                | 168.1             |
| yuanv1a              | 9176              | 5/23/2007 18:00  | 7.83                          | 2.7E                | 39.6                 | 1,459              | 514.3                | 122.1             |
| yuanv1a              | 9192              | 6/6/2007 19:30   | 7.59                          | <0.9                | 25.6                 | 1,468              | 513.8                | 138.3             |
| yuanv1a              | 9212              | 6/20/2007 21:30  | 7.78                          | 1.1E                | 25.3                 | 1,491              | 539.4                | 102.3             |

**Table 37.** Water quality, field measurements, and laboratory analyses – Yukon River at Anvik River, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| yuanvla              | 9008              | 3/18/2006 16:35  | 2739                             | 40.6                | 16.4               | 685.5              | -1                       |
| yuanvla              | 9036              | 5/4/2006 10:20   | 2,667                            | 38.5                | 13.3               | 665.1              | --                       |
| yuanvla              | 9061              | 6/5/2006 10:50   | 1,213                            | 15.3                | 4.80               | 419.2              | 5                        |
| yuanvla              | 9078              | 6/18/2006 20:30  | 1,438                            | 21.5                | 5.90               | 609.4              | 3                        |
| yuanvla              | 9104              | 7/12/2006 10:00  | 1,428                            | 14.0                | 6.70               | 756.5              | 4                        |
| yuanvla              | 9118              | 8/23/2006 22:05  | 1,639                            | 27.1                | 7.70               | 1,001              | 3                        |
| yuanvla              | 9164              | 4/22/2007 17:35  | 2,718                            | 33.9                | 12.9               | 798.0              | -1                       |
| yuanvla              | 9176              | 5/23/2007 18:00  | 1,443                            | 41.0                | 5.00               | 517.9              | 3                        |
| yuanvla              | 9192              | 6/6/2007 19:30   | 1,455                            | 30.1                | 2.00               | 530.8              | 3                        |
| yuanvla              | 9212              | 6/20/2007 21:30  | 1,423                            | 21.8                | 5.00               | 595.7              | 3                        |

**Table 37.** Water quality, field measurements, and laboratory analyses – Yukon River at Anvik River, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| yuanv1a                 | 9008                 | 3/18/2006 16:35  | 0.063                         | 1.3  | 4.70                                  | 5,674                      | 3,771                                   | 3.2              | -158.3               | -20.34                |
| yuanv1a                 | 9036                 | 5/4/2006 10:20   | 0.295                         | n/a  | 2.70                                  | 6,231                      | 3,599                                   | 3.0              | -157.9               | -20.38                |
| yuanv1a                 | 9061                 | 6/5/2006 10:50   | 0.424                         | 3.6  | 11.9                                  | 2,861                      | 1,521                                   | 4.2              | -173.8               | -22.53                |
| yuanv1a                 | 9078                 | 6/18/2006 20:30  | 0.243                         | 3.2  | 7.60                                  | 3,688                      | 1,897                                   | 4.6              | -165.8               | -21.35                |
| yuanv1a                 | 9104                 | 7/12/2006 10:00  | 0.208                         | 2.8  | 7.50                                  | 702                        | 1,716                                   | 5.2              | -162.5               | -20.87                |
| yuanv1a                 | 9118                 | 8/23/2006 22:05  | 0.154                         | 3.3  | 4.70                                  | 1,318                      | 1,927                                   | 6.3              | --                   | --                    |
| yuanv1a                 | 9164                 | 4/22/2007 17:35  | 0.081                         | 2.1  | 3.90                                  | 5,694                      | 3,438                                   | 13.7             | -158.0               | -20.33                |
| yuanv1a                 | 9176                 | 5/23/2007 18:00  | 0.433                         | 3.4  | 12.7                                  | 980                        | 2,383                                   | 4.7              | -166.5               | -21.24                |
| yuanv1a                 | 9192                 | 6/6/2007 19:30   | 0.333                         | 3.2  | 10.5                                  | 2,082                      | 2,332                                   | 4.2              | -176.5               | -22.58                |
| yuanv1a                 | 9212                 | 6/20/2007 21:30  | 0.093                         | 3.4  | 2.70                                  | 1,731                      | 1,615                                   | 3.6              | --                   | -21.36                |

**Table 38.** Water quality, field measurements, and laboratory analyses – Yukon River at Russian Mission, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yursh1a              | 9067              | 6/3/2006 12:39   | Open water     | --                    | 12.6                    | --                 | 7.59                               | 148                             |
| yursh1a              | 9103              | 7/10/2006 --     | Open water     | 19.0                  | 18.8                    | --                 | 7.58                               | --                              |
| yursh1a              | 9142              | 10/19/2006 13:00 | Open water     | --                    | 10.8                    | --                 | 7.70                               | 230                             |
| yursh1a              | 9180              | 5/25/2007 --     | Open water     | 10.0                  | 10.1                    | --                 | 7.98                               | --                              |
| yursh1a              | 9201              | 6/11/2007 10:00  | Open water     | 16.0                  | 15.2                    | --                 | 7.98                               | 192                             |
| yursh1a              | 9222              | 7/2/2007 11:00   | Open water     | 13.3                  | 17.2                    | --                 | 8.13                               | 221                             |
| yursh1a              | 9260              | 8/2/2007 11:00   | Open water     | 13.9                  | 17.7                    | --                 | 7.60                               | 232                             |
| yursh1a              | 9780              | 7/23/2008 14:29  | Open water     | --                    | 15.1                    | --                 | 8.02                               | --                              |
| yursh1a              | 9914              | 8/12/2008 15:00  | Open water     | --                    | 14.4                    | --                 | 7.86                               | 226                             |
| yursh1a              | 9878              | 8/28/2008 13:30  | Open water     | 10.9                  | 14.0                    | --                 | 7.94                               | --                              |

**Table 38.** Water quality, field measurements, and laboratory analyses – Yukon River at Russian Mission, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yursh1a              | 9067              | 6/3/2006 12:39   | 7.80                          | n/a                 | n/a                  | n/a                | n/a                  | n/a               |
| yursh1a              | 9103              | 7/10/2006 --     | 7.94                          | <0.9                | 30.2                 | 1,540              | 667.8                | 105.1             |
| yursh1a              | 9142              | 10/19/2006 13:00 | 7.77                          | <0.9                | 19.9                 | 1,640              | 774.7                | 129.4             |
| yursh1a              | 9180              | 5/25/2007 --     | 7.71                          | <0.9                | 30.9                 | 1,375              | 484.5                | 109.9             |
| yursh1a              | 9201              | 6/11/2007 10:00  | 7.69                          | <0.9                | --                   | 1,476              | 513.5                | 83.00             |
| yursh1a              | 9222              | 7/2/2007 11:00   | 7.82                          | <0.9                | 16.3                 | 1,558              | 590.9                | 196.0             |
| yursh1a              | 9260              | 8/2/2007 11:00   | 7.98                          | 3.8E                | 30.8                 | 1,619              | 591.4                | 166.0             |
| yursh1a              | 9780              | 7/23/2008 14:29  | 7.20                          | 4.8E                | 26.0                 | 1,697              | 662.6                | 200.1             |
| yursh1a              | 9914              | 8/12/2008 15:00  | --                            | <0.9                | 32.1                 | 1,680              | 724.9                | 156.6             |
| yursh1a              | 9878              | 8/28/2008 13:30  | 8.39                          | <0.9                | 124.7                | 1,738              | 741.1                | 162.1             |

**Table 38.** Water quality, field measurements, and laboratory analyses – Yukon River at Russian Mission, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| yursh1a              | 9067              | 6/3/2006 12:39   | 1,166                            | 22.5                | 6.90               | 312.3              | --                       |
| yursh1a              | 9103              | 7/10/2006 --     | 1,417                            | 13.2                | 6.40               | 739.4              | 4                        |
| yursh1a              | 9142              | 10/19/2006 13:00 | 1,581                            | 26.0                | 12.5               | 765.3              | 4                        |
| yursh1a              | 9180              | 5/25/2007 --     | 1,377                            | 26.0                | 7.10               | 464.8              | 3                        |
| yursh1a              | 9201              | 6/11/2007 10:00  | 1,409                            | --                  | 4.60               | 521.0              | --                       |
| yursh1a              | 9222              | 7/2/2007 11:00   | 1,514                            | 57.7                | 5.80               | 697.0              | 2                        |
| yursh1a              | 9260              | 8/2/2007 11:00   | 1,476                            | 30.4                | 5.50               | 782.6              | 2                        |
| yursh1a              | 9780              | 7/23/2008 14:29  | 1,546                            | 37.9                | 5.70               | 877.5              | 2                        |
| yursh1a              | 9914              | 8/12/2008 15:00  | 1,519                            | 32.7                | 10.6               | 816.3              | 3                        |
| yursh1a              | 9878              | 8/28/2008 13:30  | 1,580                            | 124.7               | 7.00               | 865.5              | 4                        |

**Table 38.** Water quality, field measurements, and laboratory analyses – Yukon River at Russian Mission, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| yursh1a                 | 9067                 | 6/3/2006 12:39   | 0.496                         | 3.7  | 13.6                                  | 2,577                      | 1,435                                   | 6.1              | -167.3             | -21.48                |
| yursh1a                 | 9103                 | 7/10/2006 --     | 0.188                         | 3.1  | 6.10                                  | 1,161                      | 1,686                                   | 9.7              | -161.2             | -20.75                |
| yursh1a                 | 9142                 | 10/19/2006 13:00 | 0.224                         | 3.4  | 6.60                                  | 1,501                      | 1,940                                   | 5.9              | -148.9             | -19.32                |
| yursh1a                 | 9180                 | 5/25/2007 --     | 0.437                         | 3.7  | 11.9                                  | 1,880                      | 1,600                                   | 7.5              | -160.9             | -20.63                |
| yursh1a                 | 9201                 | 6/11/2007 10:00  | 0.300                         | 3.1  | 9.70                                  | 3,523                      | 2,332                                   | 4.8              | -174.1             | -22.37                |
| yursh1a                 | 9222                 | 7/2/2007 11:00   | 0.172                         | 3.1  | 5.50                                  | 3,466                      | 1,792                                   | 4.5              | -160.3             | -22.53                |
| yursh1a                 | 9260                 | 8/2/2007 11:00   | 0.184                         | 3.4  | 5.40                                  | 1,060                      | 1,722                                   | 4.3              | -158.6             | -20.42                |
| yursh1a                 | 9780                 | 7/23/2008 14:29  | 0.256                         | 4.2  | 6.10                                  | 1,416                      | 2,373                                   | 5.4              | -161.2             | -20.73                |
| yursh1a                 | 9914                 | 8/12/2008 15:00  | 0.309                         | 4.1  | 7.60                                  | n/a                        | n/a                                     | n/a              | -161.0             | -19.90                |
| yursh1a                 | 9878                 | 8/28/2008 13:30  | 0.227                         | 3.4  | 6.60                                  | --                         | 1,661                                   | --               | -161.6             | -19.90                |

**Table 39.** Water quality, field measurements, and laboratory analyses – Yukon River at Marshall, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million; δ <sup>2</sup> D, deuterium; δ <sup>18</sup> O, oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yumll1a              | 9163              | 4/9/2007 14:00   | Under ice      | 10.0                  | 1.30                    | --                 | 8.26                               | --                              |
| yumll1a              | 9198              | 6/6/2007 17:19   | Open water     | 13.3                  | 14.5                    | --                 | 7.85                               | 199                             |
| yumll1a              | 9209              | 6/20/2007 13:53  | Open water     | 12.8                  | 15.6                    | --                 | --                                 | 195                             |
| yumll1a              | 9218              | 7/3/2007 14:18   | Open water     | 25.6                  | 17.8                    | --                 | 7.88                               | 212                             |
| yumll1a              | 9262              | 8/2/2007 14:20   | Open water     | 18.0                  | 17.4                    | --                 | 7.64                               | 208                             |
| yumll1a              | 9269              | 8/15/2007 13:58  | Open water     | 12.8                  | 16.7                    | --                 | 7.47                               | 274                             |

**Table 39.** Water quality, field measurements, and laboratory analyses – Yukon River at Marshall, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yumll1a              | 9289              | 8/30/2007 19:09  | Open water     | 16.2                  | 15.9                    | --                 | 7.69                               | 218                             |
| yumll1a              | 9439              | 4/9/2008 17:09   | Open water     | 15.0                  | 12.5                    | --                 | 8.16                               | 279                             |
| yumll1a              | 9404              | 4/30/2008 15:30  | Under ice      | 4.00                  | 1.70                    | --                 | 8.36                               | 157                             |
| yumll1a              | 9463              | 6/23/2008 16:18  | Open water     | 15.0                  | 15.4                    | --                 | 8.10                               | 192                             |
| yumll1a              | 9694              | 7/7/2008 10:46   | Open water     | 15.0                  | 18.1                    | --                 | 7.87                               | 229                             |
| yumll1a              | 9774              | 7/22/2008 15:00  | Open water     | 20.2                  | 16.3                    | --                 | 8.09                               | 224                             |
| yumll1a              | 9917              | 8/5/2008 14:50   | Open water     | 16.0                  | 14.5                    | --                 | 8.06                               | 230                             |

**Table 39.** Water quality, field measurements, and laboratory analyses – Yukon River at Marshall, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yumll1a              | 9163              | 4/9/2007 14:00   | 6.99                          | <0.9                | 38.1                 | 2,636              | 933.0                | 155.8             |
| yumll1a              | 9198              | 6/6/2007 17:19   | 7.53                          | 11                  | 27.8                 | 1,523              | 543.2                | 137.5             |
| yumll1a              | 9209              | 6/20/2007 13:53  | 7.71                          | --                  | --                   | --                 | --                   | --                |
| yumll1a              | 9218              | 7/3/2007 14:18   | 7.8                           | <0.9                | 28.5                 | 1,551              | 586.3                | 125.7             |
| yumll1a              | 9262              | 8/2/2007 14:20   | 7.73                          | <0.9                | 27.2                 | 1,557              | 679.6                | 296.9             |
| yumll1a              | 9269              | 8/15/2007 13:58  | 7.75                          | 9.5                 | 40.1                 | 1,655              | 589.6                | 278.3             |
| yumll1a              | 9289              | 8/30/2007 19:09  | 7.70                          | <0.9                | 28.6                 | 1,633              | 720.2                | 280.4             |
| yumll1a              | 9404              | 4/30/2008 15:30  | 7.32                          | <0.9                | 20.1                 | 1,271              | 450.6                | 220.0             |
| yumll1a              | 9439              | 4/9/2008 17:09   | 6.96                          | 15                  | 36.4                 | 2,211              | 754.8                | 171.3             |
| yumll1a              | 9463              | 6/23/2008 16:18  | 7.7                           | <0.9                | 16.1                 | 1,465              | 621.7                | 132.5             |
| yumll1a              | 9694              | 7/7/2008 10:46   | 7.61                          | <0.9                | 25.7                 | 1,678              | 628.9                | 161.9             |
| yumll1a              | 9774              | 7/22/2008 15:00  | 7.51                          | <0.9                | 26.7                 | 1,751              | 679.4                | 198.7             |
| yumll1a              | 9917              | 8/5/2008 14:50   | 7.70                          | <0.9                | 28.2                 | 1,700              | 726.3                | 248.9             |

**Table 39.** Water quality, field measurements, and laboratory analyses – Yukon River at Marshall, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| yumll1a              | 9163              | 4/9/2007 14:00   | 3,100                            | 34.3                | 12.1               | 679.6              | -1                       |
| yumll1a              | 9198              | 6/6/2007 17:19   | 1,508                            | 35.4                | 4.30               | 577.7              | 3                        |
| yumll1a              | 9209              | 6/20/2007 13:53  | --                               | --                  | --                 | --                 | --                       |
| yumll1a              | 9218              | 7/3/2007 14:18   | 1,495                            | 24.6                | 4.60               | 679.1              | 2                        |
| yumll1a              | 9262              | 8/2/2007 14:20   | 1,575                            | 37.6                | 2.30               | 773.2              | 3                        |
| yumll1a              | 9269              | 8/15/2007 13:58  | 1,619                            | 41.0                | 6.20               | 853.5              | 1                        |
| yumll1a              | 9289              | 8/30/2007 19:09  | 1,564                            | 34.5                | 3.00               | 906.6              | 3                        |
| yumll1a              | 9439              | 4/9/2008 17:09   | 1,322                            | 37.3                | 12.5               | 487.1              | 4                        |
| yumll1a              | 9404              | 4/30/2008 15:30  | 2,728                            | 32.6                | 23.7               | 439.4              | 4                        |
| yumll1a              | 9463              | 6/23/2008 16:18  | 1,377                            | 36.9                | 4.60               | 699.8              | -1                       |
| yumll1a              | 9694              | 7/7/2008 10:46   | 1,502                            | 20.4                | 7.30               | 858.4              | 2                        |
| yumll1a              | 9774              | 7/22/2008 15:00  | 1,579                            | 38.6                | 6.20               | 920.0              | 3                        |
| yumll1a              | 9917              | 8/5/2008 14:50   | 1,638                            | 37.2                | 5.4                | 812.3              | 4                        |

**Table 39.** Water quality, field measurements, and laboratory analyses – Yukon River at Marshall, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| yumll1a                 | 9163                 | 4/9/2007 14:00   | 0.061                         | 2.1  | 2.90                                  | 11,933                     | 4,338                                   | 373              | -152.0             | -19.60                |
| yumll1a                 | 9198                 | 6/6/2007 17:19   | 0.331                         | 3.3  | 10.1                                  | 2,594                      | 2,428                                   | 4.6              | -166.5             | -21.44                |
| yumll1a                 | 9209                 | 6/20/2007 13:53  | 0.275                         | 4.0  | 6.80                                  | 1,331                      | 1,595                                   | 3.1              | --                 | -22.52                |
| yumll1a                 | 9218                 | 7/3/2007 14:18   | 0.270                         | 4.9  | 5.50                                  | --                         | 1,644                                   | 4.7              | -161.1             | -22.32                |
| yumll1a                 | 9262                 | 8/2/2007 14:20   | 0.201                         | 3.1  | 6.60                                  | 447                        | 1,725                                   | 5.9              | -159.1             | -20.21                |
| yumll1a                 | 9269                 | 8/15/2007 13:58  | 0.142                         | 2.6  | 5.40                                  | 925                        | 1,751                                   | 4.6              | -156.8             | -20.20                |
| yumll1a                 | 9289                 | 8/30/2007 19:09  | 0.266                         | 3.8  | 7.00                                  | 1,091                      | 1,720                                   | 4.5              | -150.9             | -19.35                |
| yumll1a                 | 9404                 | 4/30/2008 15:30  | 0.093                         | 2.7  | 3.50                                  | 6,597                      | 3,875                                   | 199              | -150.9             | -19.44                |
| yumll1a                 | 9439                 | 4/9/2008 17:09   | 0.415                         | 3.2  | 12.9                                  | 603                        | 1,656                                   | 4.1              | -157.0             | -19.31                |
| yumll1a                 | 9463                 | 6/23/2008 16:18  | 0.245                         | 3.6  | 6.80                                  | n/a                        | n/a                                     | n/a              | -161.8             | -20.82                |
| yumll1a                 | 9694                 | 7/7/2008 10:46   | 0.206                         | 3.7  | 5.60                                  | n/a                        | n/a                                     | n/a              | -160.9             | -20.60                |
| yumll1a                 | 9774                 | 7/22/2008 15:00  | 0.189                         | 2.7  | 1.40                                  | n/a                        | n/a                                     | n/a              | -143.4             | -18.59                |
| yumll1a                 | 9917                 | 8/5/2008 14:50   | 0.223                         | 3.5  | 6.40                                  | n/a                        | n/a                                     | n/a              | -163.8             | -20.80                |

**Table 40.** Water quality, field measurements, and laboratory analyses – Yukon River at Pilot Station, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| yupqs1a              | 9072              | 6/8/2006 13:30   | Open water     | 12.0                                  | 11.1                                    | --                 | 7.60                               | --                                                  |
| yupqs1a              | 9082              | 6/22/2006 13:05  | Open water     | 14.1                                  | 15.7                                    | 8.35               | 7.49                               | 202                                                 |
| yupqs1a              | 9101              | 7/12/2006 15:20  | Open water     | 22.5                                  | 17.5                                    | --                 | 7.53                               | ---                                                 |
| yupqs1a              | 9120              | 9/11/2006 --     | Open water     | --                                    | 11.6                                    | --                 | 7.80                               | --                                                  |
| yupqs1a              | 9169              | 5/18/2007 11:25  | Open water     | 4.30                                  | 4.1                                     | --                 | 7.953                              | 117                                                 |
| yupqs1a              | 9189              | 6/1/2007 13:40   | Open water     | 17.9                                  | 12.6                                    | --                 | 8.20                               | --                                                  |
| yupqs1a              | 9205              | 6/13/2007 11:50  | Open water     | 12.1                                  | 15.2                                    | --                 | --                                 | 147                                                 |
| yupqs1a              | 9216              | 6/29/2007 12:30  | Open water     | 10.6                                  | 16.2                                    | --                 | 7.94                               | 158                                                 |
| yupqs1a              | 9247              | 7/25/2007 15:05  | Open water     | 23.6                                  | 17.7                                    | --                 | 7.59                               | 182                                                 |

**Table 40.** Water quality, field measurements, and laboratory analyses – Yukon River at Pilot Station, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yupqs1a              | 9255              | 8/7/2007 15:15   | Open water     | 15.6                  | 16.7                    | --                 | 7.65                               | 179.5                           |
| yupqs1a              | 9327              | 8/31/2007 12:45  | Open water     | --                    | 16.0                    | --                 | --                                 | 200.0                           |
| yupqs1a              | 9441              | 6/11/2008 9:40   | Open water     | 9.72                  | 12.4                    | --                 | 7.97                               | 125.9                           |
| yupqs1a              | 9697              | 7/10/2008 10:15  | Open water     | 10.4                  | 17.6                    | --                 | 7.90                               | 200.0                           |
| yupqs1a              | 9783              | 8/1/2008 9:45    | Open water     | 10.6                  | 15.0                    | --                 | 8.22                               | 191.0                           |
| yupqs1a              | 9912              | 8/11/2008 10:48  | Open water     | 15.6                  | 14.0                    | --                 | 7.95                               | 188.9                           |
| yupqs1a              | 9916              | 8/11/2008 11:21  | Open water     | 15.6                  | 14.0                    | --                 | 8.03                               | 189.0                           |
| yupqs1a              | 9872              | 8/27/2008 10:50  | Open water     | 9.10                  | 13.9                    | --                 | --                                 | 190.6                           |
| yupqs1a              | 9958              | 9/9/2008 10:44   | Open water     | 12.0                  | 12.5                    | --                 | 8.09                               | 192.0                           |

**Table 40.** Water quality, field measurements, and laboratory analyses – Yukon River at Pilot Station, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yupqs1a              | 9072              | 6/8/2006 13:30   | 7.66                          | <0.9                | 63.1                 | 1,230              | 406.3                | 65.60             |
| yupqs1a              | 9082              | 6/22/2006 13:05  | 7.66                          | <0.9                | 25.0                 | 1,376              | 550.3                | 93.00             |
| yupqs1a              | 9101              | 7/12/2006 15:20  | 7.04                          | <0.9                | 29.6                 | 1,551              | 662.7                | 103.1             |
| yupqs1a              | 9120              | 9/11/2006 --     | 7.87                          | 6.4                 | 23.3                 | 1,645              | 742.4                | 112.6             |
| yupqs1a              | 9169              | 5/18/2007 11:25  | 7.55                          | <0.9                | 24.1                 | 1,378              | 419.9                | 145.4             |
| yupqs1a              | 9189              | 6/1/2007 13:40   | 7.70                          | <0.9                | 33.5                 | 1,416              | 480.4                | 110.8             |
| yupqs1a              | 9205              | 6/13/2007 11:50  | 7.18                          | --                  | --                   | --                 | --                   | --                |
| yupqs1a              | 9216              | 6/29/2007 12:30  | 7.90                          | <0.9                | 31.3                 | 1,488              | 542.0                | 105.1             |
| yupqs1a              | 9247              | 7/25/2007 15:05  | 7.86                          | 2.0E                | 32.7                 | 1,563              | 673.2                | 173.7             |

**Table 40.** Water quality, field measurements, and laboratory analyses – Yukon River at Pilot Station, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yupqsla              | 9255              | 8/7/2007 15:15   | 7.89                          | <0.9                | 32.1                 | 1,603              | 559.5                | 192.0             |
| yupqsla              | 9327              | 8/31/2007 12:45  | 8.25                          | --                  | --                   | --                 | --                   | --                |
| yupqsla              | 9441              | 6/11/2008 9:40   | 7.77                          | <0.9                | 27.7                 | 1,316              | 460.2                | 82.00             |
| yupqsla              | 9697              | 7/10/2008 10:15  | 8.03                          | 5.0E                | 30.1                 | 1,678              | 615.6                | 271.7             |
| yupqsla              | 9783              | 8/1/2008 9:45    | 8.03                          | <0.9                | 28.6                 | 1,679              | 738.8                | 162.3             |
| yupqsla              | 9912              | 8/11/2008 10:48  | 7.93                          | <0.9                | 25.7                 | 1,721              | 706.9                | 306.0             |
| yupqsla              | 9916              | 8/11/2008 11:21  | 7.93                          | <0.9                | 27.7                 | 1,739              | 737.0                | 324.0             |
| yupqsla              | 9872              | 8/27/2008 10:50  | 8.00                          | <0.9                | 40.1                 | 265.0              | 337.9                | 287.0             |
| yupqsla              | 9958              | 9/9/2008 10:44   | 7.98                          | <0.9                | 40.9                 | 1,815              | 804.4                | 264.5             |

**Table 40.** Water quality, field measurements, and laboratory analyses – Yukon River at Pilot Station, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| yupqs1a              | 9072              | 6/8/2006 13:30   | 1,154                            | 76.2                | 5.40               | 346.4              | 5                        |
| yupqs1a              | 9082              | 6/22/2006 13:05  | 1,339                            | 16.5                | 6.20               | 520.8              | 4                        |
| yupqs1a              | 9101              | 7/12/2006 15:20  | 1,414                            | 12.0                | 6.90               | 740.6              | 4                        |
| yupqs1a              | 9120              | 9/11/2006 --     | 1,465                            | 20.0                | 10.2               | 854.7              | 4                        |
| yupqs1a              | 9169              | 5/18/2007 11:25  | 1,416                            | 49.6                | 14.2               | 464.8              | 1                        |
| yupqs1a              | 9189              | 6/1/2007 13:40   | 1,535                            | 28.8                | 5.50               | 487.8              | 0                        |
| yupqs1a              | 9205              | 6/13/2007 11:50  | --                               | --                  | --                 | --                 | --                       |
| yupqs1a              | 9216              | 6/29/2007 12:30  | 1,429                            | 25.7                | 5.10               | 604.8              | 2                        |
| yupqs1a              | 9247              | 7/25/2007 15:05  | 1,479                            | 40.2                | 5.60               | 757.7              | 3                        |

**Table 40.** Water quality, field measurements, and laboratory analyses – Yukon River at Pilot Station, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| yupqs1a              | 9255              | 8/7/2007 15:15   | 1,485                            | 60.0                | 5.00               | 789.0              | 1                        |
| yupqs1a              | 9327              | 8/31/2007 12:45  | --                               | --                  | --                 | --                 | --                       |
| yupqs1a              | 9441              | 6/11/2008 9:40   | 1,237                            | 16.7                | 23.8               | 431.3              | 3                        |
| yupqs1a              | 9697              | 7/10/2008 10:15  | 1,606                            | 22.1                | 5.50               | 858.0              | 2                        |
| yupqs1a              | 9783              | 8/1/2008 9:45    | 1,577                            | --                  | --                 | --                 | --                       |
| yupqs1a              | 9912              | 8/11/2008 10:48  | 1,652                            | 58.4                | 6.8                | 845.5              | 4                        |
| yupqs1a              | 9916              | 8/11/2008 11:21  | 1,704                            | 37.5                | 8.6                | 855.3              | 4                        |
| yupqs1a              | 9872              | 8/27/2008 10:50  | --                               | --                  | --                 | --                 | --                       |
| yupqs1a              | 9958              | 9/9/2008 10:44   | 1,784                            | 56.5                | 6.5                | 876.3              | 3                        |

**Table 40.** Water quality, field measurements, and laboratory analyses – Yukon River at Pilot Station, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| yupqsla                 | 9072                 | 6/8/2006 13:30   | 0.419                         | 3.6  | 11.6                                  | 1,448                      | 1,404                                   | 7.0              | -168.5               | -21.76                |
| yupqsla                 | 9082                 | 6/22/2006 13:05  | 0.248                         | 3.2  | 7.90                                  | 2,061                      | 1,626                                   | 5.7              | -159.3               | -20.70                |
| yupqsla                 | 9101                 | 7/12/2006 15:20  | 0.205                         | 3.3  | 6.20                                  | 2,521                      | 1,691                                   | 5.1              | -160.9               | -20.70                |
| yupqsla                 | 9120                 | 9/11/2006 --     | 0.279                         | 3.0  | 9.40                                  | 3,323                      | 1,793                                   | 2.9              | -154.5               | -19.95                |
| yupqsla                 | 9169                 | 5/18/2007 11:25  | 0.022                         | 1.7  | 1.30                                  | 1,329                      | 2,427                                   | 7.3              | -156.6               | -20.14                |
| yupqsla                 | 9189                 | 6/1/2007 13:40   | 0.430                         | 3.8  | 11.4                                  | 1,952                      | 2,374                                   | 8.0              | -161.9               | -20.76                |
| yupqsla                 | 9205                 | 6/13/2007 11:50  | --                            | --   | --                                    | 1,827                      | 2,256                                   | 5.2              | --                   | --                    |
| yupqsla                 | 9216                 | 6/29/2007 12:30  | 0.214                         | 3.4  | 6.30                                  | 431.0                      | 1,559                                   | 4.5              | -162.6               | -22.22                |
| yupqsla                 | 9247                 | 7/25/2007 15:05  | 0.175                         | 3.5  | 5.00                                  | 1,114                      | 1,670                                   | 5.4              | -159.9               | -20.52                |

**Table 40.** Water quality, field measurements, and laboratory analyses – Yukon River at Pilot Station, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| yupqsla                 | 9255                 | 8/7/2007 15:15   | 0.190                         | 3.7  | 5.20                                  | 179                        | 1,697                                   | 5.3              | -158.14              | -20.39                |
| yupqsla                 | 9327                 | 8/31/2007 12:45  | 0.252                         | 3.1  | 8.00                                  | 660                        | 1,703                                   | 5.4              | --                   | --                    |
| yupqsla                 | 9441                 | 6/11/2008 9:40   | 0.397                         | 3.6  | 11.1                                  | 841                        | 1,737                                   | 4.6              | -166.29              | -21.36                |
| yupqsla                 | 9697                 | 7/10/2008 10:15  | 0.199                         | 3.5  | 5.60                                  | 364                        | 1,769                                   | 5.9              | -160.21              | -20.59                |
| yupqsla                 | 9783                 | 8/1/2008 9:45    | 0.179                         | 3.2  | 5.60                                  | 1,552                      | 1,782                                   | 5.6              | -162.30              | -20.69                |
| yupqsla                 | 9912                 | 8/11/2008 10:48  | 0.223                         | 2.8  | 7.90                                  | --                         | 1,944                                   | 5.2              | --                   | --                    |
| yupqsla                 | 9916                 | 8/11/2008 11:21  | 0.225                         | 3.9  | 6.50                                  | --                         | 1,824                                   | 5.5              | --                   | --                    |
| yupqsla                 | 9872                 | 8/27/2008 10:50  | 0.248                         | 4.0  | 6.20                                  | 126                        | --                                      | 8.3              | --                   | --                    |
| yupqsla                 | 9958                 | 9/9/2008 10:44   | 0.194                         | 3.3  | 5.90                                  | 645                        | 2,026                                   | 5.7              | --                   | --                    |

**Table 41.** Water quality, field measurements, and laboratory analyses – Yukon River at Saint Mary's, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed Council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; \*, probable cause of poor ion balance; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| yuksm1a              | 9065              | 6/5/2006 11:00   | Open water     | --                                    | 11.1                                    | 8.19               | 7.45                               | 157                                                 |
| yuksm1a              | 9080              | 6/22/2006 15:32  | Open water     | 16.5                                  | 15.6                                    | 8.70               | 7.54                               | 197                                                 |
| yuksm1a              | 9111              | 7/19/2006 15:50  | Open water     | 17.8                                  | 16.0                                    | 8.25               | 7.53                               | 189                                                 |
| yuksm1a              | 9168              | 5/16/2007 11:12  | Open water     | 7.78                                  | 2.30                                    | --                 | 7.44                               | 156                                                 |
| yuksm1a              | 9186              | 6/6/2007 11:30   | Open water     | 20.0                                  | 14.2                                    | --                 | 8.15                               | n/a                                                 |
| yuksm1a              | 9252              | 7/24/2007 11:00  | Open water     | --                                    | 17.2                                    | --                 | 7.56                               | 251                                                 |
| yuksm1a              | 9280              | 8/20/2007 10:25  | Open water     | 21.7                                  | 17.2                                    | --                 | 7.66                               | 266                                                 |
| yuksm1a              | 9401              | 4/17/2008 9:05   | Under ice      | --                                    | 0.20                                    | --                 | 8.33                               | 360                                                 |
| yuksm1a              | 9450              | 6/17/2008 9:45   | Open water     | 11.1                                  | 13.9                                    | --                 | 8.04                               | 194                                                 |
| yuksm1a              | 9466              | 7/1/2008 11:15   | Open water     | 14.9                                  | 16.0                                    | --                 | 8.14                               | 252                                                 |
| yuksm1a              | 9759              | 7/15/2008 11:00  | Open water     | 19.2                                  | 16.2                                    | --                 | 7.97                               | 256                                                 |

**Table 41.** Water quality, field measurements, and laboratory analyses – Yukon River at Saint Mary's, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yuksmla              | 9065              | 6/5/2006 11:00   | 7.53                          | 7.4E                | 15.3                 | 497.7*             | 182.2                | 81.40             |
| yuksmla              | 9080              | 6/22/2006 15:32  | 7.68                          | <0.9                | 40.4                 | 1,332              | 531.7                | 91.50             |
| yuksmla              | 9111              | 7/19/2006 15:50  | 7.90                          | <0.9                | 25.2                 | 1,538              | 672.9                | 106.9             |
| yuksmla              | 9168              | 5/16/2007 11:12  | 7.56                          | <0.9                | 24.3                 | 1,239              | 406.3                | 96.40             |
| yuksmla              | 9186              | 6/6/2007 11:30   | 7.97                          | <0.9                | 34.0                 | 1,505              | 491.5                | 114.3             |
| yuksmla              | 9252              | 7/24/2007 11:00  | 8.15                          | 3.5E                | 30.8                 | 1,611              | 564.0                | 174.6             |
| yuksmla              | 9280              | 8/20/2007 10:25  | 8.15                          | <0.9                | 28.5                 | 1,712              | 578.4                | 196.3             |
| yuksmla              | 9401              | 4/17/2008 9:05   | 7.12                          | 10.8                | 42.5                 | 2,347              | 789.8                | 300.9             |
| yuksmla              | 9450              | 6/17/2008 9:45   | 7.7                           | <0.9                | 26.2                 | 1,360              | 519.0                | 101.9             |
| yuksmla              | 9466              | 7/1/2008 11:15   | 7.87                          | --                  | --                   | --                 | --                   | --                |
| yuksmla              | 9759              | 7/15/2008 11:00  | 8.08                          | 2.2E                | 27.7                 | 1,677              | 678.3                | 158.8             |

**Table 41.** Water quality, field measurements, and laboratory analyses – Yukon River at Saint Mary's, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| yuksmla              | 9065              | 6/5/2006 11:00   | 1,199                            | 18.8                | 6.90               | 320.7              | -33                      |
| yuksmla              | 9080              | 6/22/2006 15:32  | 1,309                            | 16.8                | 5.80               | 489.3              | 5                        |
| yuksmla              | 9111              | 7/19/2006 15:50  | 1,408                            | 13.8                | 7.30               | 742.7              | 4                        |
| yuksmla              | 9168              | 5/16/2007 11:12  | 579.4*                           | 24.5                | 8.60               | 349.3              | 29                       |
| yuksmla              | 9186              | 6/6/2007 11:30   | 1,444                            | 29.6                | 6.50               | 562.8              | 2                        |
| yuksmla              | 9252              | 7/24/2007 11:00  | 1,483                            | 40.4                | 5.80               | 780.5              | 2                        |
| yuksmla              | 9280              | 8/20/2007 10:25  | 1,510                            | 59.7                | 6.50               | 956.8              | 0                        |
| yuksmla              | 9401              | 4/17/2008 9:05   | 2,994                            | 67.1                | 15.0               | 541.6              | -2                       |
| yuksmla              | 9450              | 6/17/2008 9:45   | 1,299                            | 21.6                | 5.30               | 510.4              | 2                        |
| yuksmla              | 9466              | 7/1/2008 11:15   | 1,548                            | --                  | --                 | --                 | 4                        |
| yuksmla              | 9759              | 7/15/2008 11:00  | 1,532                            | 41.8                | 14.1               | 823.5              | 3                        |

**Table 41.** Water quality, field measurements, and laboratory analyses – Yukon River at Saint Mary's, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| yuksmla                 | 9065                 | 6/5/2006 11:00   | 0.679                         | 4.9  | 13.8                                  | 4,138                      | 1,241                                   | 6.5              | -168.6             | -21.93                |
| yuksmla                 | 9080                 | 6/22/2006 15:32  | 0.276                         | 3.4  | 8.10                                  | 2,770                      | 1,605                                   | 7.8              | -159.2             | -20.45                |
| yuksmla                 | 9111                 | 7/19/2006 15:50  | 0.207                         | 3.1  | 6.70                                  | 1,314                      | 1,661                                   | 6.3              | -157.1             | -20.29                |
| yuksmla                 | 9168                 | 5/16/2007 11:12  | 0.264                         | 3.6  | 7.30                                  | 1,434                      | 2,252                                   | 5.3              | -154.1             | -19.85                |
| yuksmla                 | 9186                 | 6/6/2007 11:30   | 0.348                         | 3.6  | 9.80                                  | 1,827                      | 2,404                                   | 7.3              | -165.0             | -21.10                |
| yuksmla                 | 9252                 | 7/24/2007 11:00  | 0.173                         | 3.3  | 5.30                                  | 1,116                      | 1,655                                   | 7.4              | -159.1             | -20.48                |
| yuksmla                 | 9280                 | 8/20/2007 10:25  | 0.174                         | 3.5  | 5.00                                  | 1,339                      | 1,516                                   | 5.0              | -158.0             | -20.10                |
| yuksmla                 | 9401                 | 4/17/2008 9:05   | 0.070                         | 2.3  | 3.00                                  | 6,437                      | 3,690                                   | 219              | -152.0             | -19.71                |
| yuksmla                 | 9450                 | 6/17/2008 9:45   | 0.322                         | 3.8  | 8.60                                  | 1,269                      | 1,783                                   | 5.7              | -161.4             | -20.82                |
| yuksmla                 | 9466                 | 7/1/2008 11:15   | 0.211                         | 3.6  | 5.90                                  | n/a                        | n/a                                     | n/a              | -161.0             | -20.57                |
| yuksmla                 | 9759                 | 7/15/2008 11:00  | 0.207                         | 3.2  | 6.50                                  | n/a                        | n/a                                     | n/a              | -159.9             | -20.42                |

**Table 42.** Water quality, field measurements, and laboratory analyses – North Fork Andreafsky River at Saint Mary's, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range;  $\mu\text{S}/\text{cm}$ , microsiemen per centimeter at 25 degrees Celsius;  $^{\circ}\text{C}$ , Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer;  $\mu\text{eq}/\text{L}$ , microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; \*. Probable cause of poor ion balance; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature $^{\circ}\text{C}$ | Water<br>temperature $^{\circ}\text{C}$ | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>( $\mu\text{S}/\text{cm}$ ) |
|----------------------|-------------------|------------------|----------------|---------------------------------------|-----------------------------------------|--------------------|------------------------------------|-----------------------------------------------------|
| anksm1a              | 9055              | 5/25/2006 16:00  | Open water     | 16.5                                  | 4.80                                    | 12.1               | 7.05                               | 67.9                                                |
| anksm1a              | 9066              | 6/5/2006 12:00   | Open water     | 10.0                                  | 9.10                                    | 10.1               | 7.09                               | 57.7                                                |
| anksm1a              | 9084              | 6/22/2006 16:45  | Open water     | 18.8                                  | 12.6                                    | 11.6               | 7.19                               | 127                                                 |
| anksm1a              | 9110              | 7/19/2006 15:15  | Open water     | 16.8                                  | 15.0                                    | 9.82               | 7.43                               | 128                                                 |
| anksm1a              | 9166              | 5/16/2007 14:25  | Open water     | 15.1                                  | --                                      | --                 | 7.88                               | --                                                  |
| anksm1a              | 9190              | 6/6/2007 10:40   | Open water     | 21.1                                  | 12.8                                    | --                 | 7.25                               | 21.1                                                |
| anksm1a              | 9249              | 7/24/2007 10:00  | Open water     | 22.2                                  | 14.7                                    | --                 | 7.19                               | 99.0                                                |

**Table 42.** Water quality, field measurements, and laboratory analyses – North Fork Andreafsky River at Saint Mary's, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| anksm1a              | 9357              | 10/2/2007 13:00  | Open water     | 2.22                  | 6.70                    | --                 | 7.18                               | 84.0                            |
| anksm1a              | 9398              | 4/17/2008 8:20   | Under ice      | -2.20                 | 8.00                    | --                 | 8.16                               | 6.91                            |
| anksm1a              | 9452              | 6/17/2008 9:45   | Open water     | 11.1                  | 12.7                    | --                 | 7.80                               | 74.0                            |
| anksm1a              | 9467              | 7/1/2008 10:30   | Open water     | 21.3                  | 15.2                    | --                 | 7.72                               | 92.0                            |
| anksm1a              | 9757              | 7/15/2008 11:45  | Open water     | 19.2                  | 11.8                    | --                 | 7.62                               | 116                             |

**Table 42.** Water quality, field measurements, and laboratory analyses – North Fork Andreafsky River at Saint Mary's, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| anksm1a              | 9055              | 5/25/2006 16:00  | 7.25                          | <0.9                | 16.0                 | 425.2              | 159.0                | 73.60             |
| anksm1a              | 9066              | 6/5/2006 12:00   | 7.32                          | <0.9                | 25.8                 | 1,237.8*           | 389.1                | 63.20             |
| anksm1a              | 9084              | 6/22/2006 16:45  | 7.55                          | <0.9                | 8.60                 | 858.8              | 270.2                | 115.0             |
| anksm1a              | 9110              | 7/19/2006 15:15  | 7.84                          | <0.9                | 9.80                 | 1,106.5            | 342.5                | 138.8             |
| anksm1a              | 9166              | 5/16/2007 14:25  | --                            | <0.9                | 11.4                 | 334.6              | 198.4                | 132.3             |
| anksm1a              | 9190              | 6/6/2007 10:40   | 7.86                          | 2.0E                | 11.7                 | 430.0              | 248.6                | 108.3             |
| anksm1a              | 9249              | 7/24/2007 10:00  | 8.30                          | 2.0E                | 11.7                 | 577.5              | 313.8                | 133.9             |
| anksm1a              | 9281              | 8/20/2007 10:35  | 8.05                          | <0.9                | 12.4                 | 554.4              | 307.3                | 129.8             |
| anksm1a              | 9357              | 10/2/2007 13:00  | 8.47                          | <0.9                | 11.4                 | 334.6              | 198.4                | 132.3             |
| anksm1a              | 9398              | 4/17/2008 8:20   | 6.98                          | 36                  | 555                  | 716.0              | 403                  | 315.6             |
| anksm1a              | 9452              | 6/17/2008 9:45   | 7.80                          | 0.9E                | 8.3                  | 421.7              | 274.2                | 107.9             |
| anksm1a              | 9467              | 7/1/2008 10:30   | 7.65                          | <0.9                | 7.6                  | 485.8              | 313.4                | 147.3             |
| anksm1a              | 9757              | 7/15/2008 11:45  | 7.96                          | 3.1E                | 9.4                  | 690.1              | 329.6                | 159.1             |

**Table 42.** Water quality, field measurements, and laboratory analyses – North Fork Andreafsky River at Saint Mary's, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| anksm1a              | 9055              | 5/25/2006 16:00  | 519.0                            | 42.9                | 6.30               | 83.30              | 2                        |
| anksm1a              | 9066              | 6/5/2006 12:00   | 625.0                            | 45.8                | 7.40               | 104.7              | 37                       |
| anksm1a              | 9084              | 6/22/2006 16:45  | 983.0                            | 41.4                | 2.90               | 163.5              | 3                        |
| anksm1a              | 9110              | 7/19/2006 15:15  | 1,276                            | 42.3                | 0.40               | 212.6              | 2                        |
| anksm1a              | 9166              | 5/16/2007 14:25  | 1,353*                           | 60.1                | 13.3               | 28.40              | -36                      |
| anksm1a              | 9190              | 6/6/2007 10:40   | 712.3                            | 36.1                | 6.00               | 35.80              | 1                        |
| anksm1a              | 9249              | 7/24/2007 10:00  | 897.7                            | 32.2                | <0.2               | 32.20              | 4                        |
| anksm1a              | 9281              | 8/20/2007 10:35  | 852.9                            | 33.9                | <0.2               | 31.10              | 4                        |
| anksm1a              | 9357              | 10/2/2007 13:00  | 664.6                            | 176                 | 2.70               | 52.80              | 9                        |
| anksm1a              | 9398              | 4/17/2008 8:20   | 1,239                            | 554                 | 17.3               | 39.10              | -2                       |
| anksm1a              | 9452              | 6/17/2008 9:45   | 660.6                            | 39.3                | 1.90               | 29.00              | -1                       |
| anksm1a              | 9467              | 7/1/2008 10:30   | 796.2                            | 55.0                | 0.9E               | 28.00              | -1                       |
| anksm1a              | 9757              | 7/15/2008 11:45  | 977.9                            | 49.8                | 1.0E               | 74.60              | -1                       |

**Table 42.** Water quality, field measurements, and laboratory analyses – North Fork Andreafsky River at Saint Mary's, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| anksm1a                 | 9055                 | 5/25/2006 16:00  | 0.205                         | 3.4  | 6.00                                  | 4,426                      | 679                                     | 12.8             | -117.9             | -15.86                |
| anksm1a                 | 9066                 | 6/5/2006 12:00   | 0.174                         | 3.9  | 4.50                                  | 1,559                      | 744                                     | 17.9             | -113.7             | -15.44                |
| anksm1a                 | 9084                 | 6/22/2006 16:45  | 0.120                         | 3.3  | 3.60                                  | 1,578                      | 1,206                                   | 20.8             | -110.1             | -14.8                 |
| anksm1a                 | 9110                 | 7/19/2006 15:15  | 0.081                         | 2.6  | 3.10                                  | 1,229                      | 1,628                                   | 16.3             | -106.3             | -14.25                |
| anksm1a                 | 9166                 | 5/16/2007 14:25  | 0.641                         | 3.6  | 18.1                                  | 2,150                      | 1,000                                   | 13.3             | -114.0             | -15.34                |
| anksm1a                 | 9190                 | 6/6/2007 10:40   | 0.113                         | 3.8  | 2.90                                  | 2,061                      | 1,245                                   | 22.3             | -113.0             | -15.20                |
| anksm1a                 | 9249                 | 7/24/2007 10:00  | 0.126                         | 3.6  | 3.50                                  | 739                        | 1,087                                   | 23.4             | -107.1             | -14.38                |
| anksm1a                 | 9281                 | 8/20/2007 10:35  | 0.148                         | 3.6  | 4.20                                  | 1,130                      | 878                                     | 14.0             | -105.7             | -14.06                |
| anksm1a                 | 9357                 | 10/2/2007 13:00  | 0.641                         | 3.6  | 3.60                                  | 506                        | 795                                     | 17.4             | -105.2             | -14.24                |
| anksm1a                 | 9398                 | 4/17/2008 8:20   | 0.081                         | 4.4  | 1.80                                  | 11,635                     | 2,126                                   | 567              | -108.8             | -14.69                |
| anksm1a                 | 9452                 | 6/17/2008 9:45   | 0.122                         | 3.8  | 3.20                                  | --                         | 1,008                                   | 22.4             | -114.2             | -15.31                |
| anksm1a                 | 9467                 | 7/1/2008 10:30   | 0.127                         | 3.9  | 3.30                                  | n/a                        | n/a                                     | n/a              | -112.3             | -15.10                |
| anksm1a                 | 9757                 | 7/15/2008 11:45  | 0.100                         | 3.4  | 3.00                                  | n/a                        | n/a                                     | n/a              | -111.4             | -14.60                |

**Table 43.** Water quality, field measurements, and laboratory analyses – Yukon River at Emmonak, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed Council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million; δ <sup>2</sup> D, deuterium; δ <sup>18</sup> O, oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yuemn1a              | 9165              | 4/25/2007 16:26  | Under Ice      | 10.8                  | 0.00                    | 2.44               | --                                 | 314                             |

  

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yuemn1a              | 9165              | 4/25/2007 16:26  | 7.34                          | --                  | --                   | --                 | --                   | --                |

**Table 43.** Water quality, field measurements, and laboratory analyses – Yukon River at Emmonak, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>( $\mu$ eq/L) |  | Chloride<br>( $\mu$ eq/L) | Nitrate<br>( $\mu$ eq/L) | Sulfate<br>( $\mu$ eq/L) | Ion Balance<br>(Percent) |  |
|----------------------|-------------------|------------------|----------------------------------------|--|---------------------------|--------------------------|--------------------------|--------------------------|--|
| yuemn1a              | 9165              | 4/25/2007 16:26  | --                                     |  | 46.9                      | 15.3                     | 543.6                    | --                       |  |

  

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| yuemn1a                 | 9165                 | 4/25/2007 16:26  | 0.150                         | 4.1  | 3.70                                  | 9,006                      | 3,832                                   | 3.7              | -150.0               | -19.38                |

**Table 44.** Water quality, field measurements, and laboratory analyses – Ningliqvvak River above Chevak, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million; δ <sup>2</sup> D, deuterium; δ <sup>18</sup> O, oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| nivak1a              | 9223              | 7/2/2007 18:15   | Open water     | 15.0                  | 13.6                    | --                 | 7.89                               | 3,278                           |
| nivak1a              | 9244              | 7/17/2007 11:40  | Open water     | 15.0                  | 13.8                    | --                 | 7.52                               | 3,999                           |
| nivak1a              | 9259              | 7/31/2007 18:30  | Open water     | 12.5                  | 14.3                    | --                 | 7.78                               | 3,999                           |
| nivak1a              | 9274              | 8/21/2007 18:38  | Open water     | --                    | 15.9                    | --                 | 7.65                               | 3,999                           |
| nivak1a              | 9290              | 9/4/2007 10:15   | Open water     | 6.00                  | 13.5                    | --                 | 7.64                               | 3,999                           |
| nivak1a              | 9447              | 6/16/2008 15:23  | Open water     | 11.0                  | 10.0                    | --                 | 7.92                               | 975.0                           |
| nivak1a              | 9986              | 9/17/2008 19:27  | Open water     | 10.0                  | 11.2                    | --                 | 8.20                               | 3,618                           |

**Table 44.** Water quality, field measurements, and laboratory analyses – Ningliqvvak River above Chevak, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| nivak1a              | 9223              | 7/2/2007 18:15   | 7.76                          | <0.9                | 581                  | 1,219              | --                   | --                |
| nivak1a              | 9244              | 7/17/2007 11:40  | 7.48                          | 445                 | 687                  | 1,566              | 7,550                | 31,853            |
| nivak1a              | 9259              | 7/31/2007 18:30  | 7.60                          | <0.9                | 901                  | 2,066              | 9,545                | 41,587            |
| nivak1a              | 9274              | 8/21/2007 18:38  | 7.72                          | 403                 | 730                  | 1,636              | 7,400                | 47,177            |
| nivak1a              | 9290              | 9/4/2007 10:15   | 7.79                          | 704                 | 1400                 | 3,512              | 17,387               | 92,198            |
| nivak1a              | 9447              | 6/16/2008 15:23  | 7.56                          | --                  | --                   | --                 | --                   | --                |
| nivak1a              | 9986              | 9/17/2008 19:27  | 7.60                          | <0.9                | 1215.8               | 3,076              | 13,311               | 57,784            |

**Table 44.** Water quality, field measurements, and laboratory analyses – Ningliqvvak River above Chevak, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>( $\mu\text{eq/L}$ ) | Chloride<br>( $\mu\text{eq/L}$ ) | Nitrate<br>( $\mu\text{eq/L}$ ) | Sulfate<br>( $\mu\text{eq/L}$ ) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|-----------------------------------------------|----------------------------------|---------------------------------|---------------------------------|--------------------------|
| nivak1a              | 9223              | 7/2/2007 18:15   | 1,957                                         | <0.8                             | 35.1                            | 1,232.4                         | --                       |
| nivak1a              | 9244              | 7/17/2007 11:40  | 2,560                                         | 28,547                           | 59.4                            | 1,199.1                         | 13                       |
| nivak1a              | 9259              | 7/31/2007 18:30  | 2,863                                         | 37,520                           | 60.5                            | 1,942.4                         | 12                       |
| nivak1a              | 9274              | 8/21/2007 18:38  | 2,934                                         | 40,420                           | 59.1                            | 2,128.9                         | 11                       |
| nivak1a              | 9290              | 9/4/2007 10:15   | 3,396                                         | 90,957                           | 466.7                           | 2,080.6                         | 9                        |
| nivak1a              | 9447              | 6/16/2008 15:23  | 1,194                                         | 8,493.0                          | 47.2                            | 504.6                           | 1                        |
| nivak1a              | 9986              | 9/17/2008 19:27  | 2,673                                         | --                               | --                              | --                              | --                       |

**Table 44.** Water quality, field measurements, and laboratory analyses – Ningliqvvak River above Chevak, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| nivak1a                 | 9223                 | 7/2/2007 18:15   | 0.612                         | 4.5  | 13.7                                  | 2,582                      | 2,166                                   | 21.9             | -83.54               | -21.89                |
| nivak1a                 | 9244                 | 7/17/2007 11:40  | 0.773                         | 4.5  | 17.4                                  | 5,010                      | 3,196                                   | 37.7             | -77.91               | -9.600                |
| nivak1a                 | 9259                 | 7/31/2007 18:30  | 0.724                         | 4.6  | 15.8                                  | 4,033                      | 3,417                                   | 16.6             | -74.85               | -9.050                |
| nivak1a                 | 9274                 | 8/21/2007 18:38  | 0.829                         | 5.1  | 16.4                                  | 2,986                      | 3,372                                   | 7.50             | -72.34               | -8.810                |
| nivak1a                 | 9290                 | 9/4/2007 10:15   | 0.595                         | 5.4  | 11.0                                  | 3,361                      | 4,100                                   | 13.0             | -69.00               | -8.320                |
| nivak1a                 | 9447                 | 6/16/2008 15:23  | 0.502                         | 4.1  | 12.2                                  | 1,765                      | 1,641                                   | 17.0             | -90.15               | -11.48                |
| nivak1a                 | 9986                 | 9/17/2008 19:27  | 0.520                         | 4.9  | 10.5                                  | 2,199                      | 3,275                                   | 7.80             | -79.10               | -8.900                |

**Table 45.** Water quality, field measurements, and laboratory analyses – Yukon River above Kotlik, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million; δ <sup>2</sup> D, deuterium; δ <sup>18</sup> O, oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yukot1a              | 9435              | 6/9/2008 12:40   | Open water     | --                    | 14.0                    | --                 | 7.88                               | 175                             |
| yukot1a              | 9448              | 6/20/2008 19:30  | Open water     | --                    | 11.1                    | --                 | 7.97                               | 164                             |
| yukot1a              | 9839              | 8/5/2008 18:00   | Open water     | --                    | 14.7                    | --                 | 7.86                               | 242                             |
| yukot1a              | 9840              | 8/5/2008 18:00   | Open water     | --                    | 14.7                    | --                 | 7.89                               | 242                             |
| yukot1a              | 9889              | 8/20/2008 16:37  | Open water     | --                    | 15.2                    | --                 | 8.07                               | 242                             |
| yukot1a              | 9987              | 9/18/2008 15:15  | Open water     | --                    | 11.2                    | --                 | 8.07                               | 253                             |

**Table 45.** Water quality, field measurements, and laboratory analyses – Yukon River above Kotlik, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units)    | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L)     | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|----------------------|--------------------|--------------------------|-------------------|
| yukot1a              | 9435              | 6/9/2008 12:40   | 7.93                             | <0.9                | 30.0                 | 1,202              | 426.4                    | 104.7             |
| yukot1a              | 9448              | 6/20/2008 19:30  | 8.06                             | 1.1E                | 29.9                 | 1,349              | 488.8                    | 127.5             |
| yukot1a              | 9839              | 8/5/2008 18:00   | 8.13                             | <0.9                | 22.9                 | 1,672              | 698.4                    | 224.4             |
| yukot1a              | 9840              | 8/5/2008 18:00   | 8.13                             | --                  | --                   | --                 | --                       | --                |
| yukot1a              | 9889              | 8/20/2008 16:37  | 8.17                             | <0.9                | 26.5                 | 1,695              | 695.6                    | 176.9             |
| yukot1a              | 9987              | 9/18/2008 15:15  | 8.02                             | <0.9                | 33.2                 | 1,717              | 681.6                    | 199.5             |
| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L)   | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |                   |
| yukot1a              | 9435              | 6/9/2008 12:40   | 1,190                            | 27.8                | 23.2                 | 407.7              | 2                        |                   |
| yukot1a              | 9448              | 6/20/2008 19:30  | 1,322                            | 37.2                | 5.50                 | 509.3              | 3                        |                   |
| yukot1a              | 9839              | 8/5/2008 18:00   | 1,613                            | 16.1                | 10.7                 | 831.3              | 3                        |                   |
| yukot1a              | 9840              | 8/5/2008 18:00   | 1,609                            | --                  | --                   | --                 | --                       |                   |
| yukot1a              | 9889              | 8/20/2008 16:37  | 1,554                            | 43.8                | 11.2                 | 809.0              | 4                        |                   |
| yukot1a              | 9987              | 9/18/2008 15:15  | 1,675                            | 57.7                | 8.90                 | 840.3              | 4                        |                   |

**Table 45.** Water quality, field measurements, and laboratory analyses – Yukon River above Kotlik, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^2\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|--------------------|-----------------------|
| yukot1a                 | 9435                 | 6/9/2008 12:40   | 0.435                         | 3.2  | 13.5                                  | 1,590                      | 1,637                                   | 14.1             | -165.7             | -21.30                |
| yukot1a                 | 9448                 | 6/20/2008 19:30  | 0.307                         | 3.8  | 8.10                                  | 799                        | 1,946                                   | 16.7             | -159.0             | -20.47                |
| yukot1a                 | 9839                 | 8/5/2008 18:00   | 0.177                         | 3.1  | 5.70                                  | 1,141                      | 1,756                                   | 14.9             | -159.8             | -20.56                |
| yukot1a                 | 9840                 | 8/5/2008 18:00   | 0.196                         | 3.9  | 5.00                                  | 957                        | 1,768                                   | 15.2             | -160.9             | -20.57                |
| yukot1a                 | 9889                 | 8/20/2008 16:37  | 0.240                         | 3.4  | 7.00                                  | 1,672                      | 1,715                                   | 13.4             | -158.9             | -19.90                |
| yukot1a                 | 9987                 | 9/18/2008 15:15  | 0.281                         | 3.7  | 7.50                                  | 1,349                      | 2,131                                   | 12.1             | -161.1             | -19.50                |

**Table 46.** Water quality, field measurements, and laboratory analyses – Clear Lake at Stebbins, Alaska.

[YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; E, Estimated; n/a, not available, no sample collected; Ion balance, see Quality control/quality assurance section for explanation]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| clwbb1a              | 9405              | 5/19/2008 8:55   | Under ice      | 3.90                  | 1.10                    | --                 | 6.55                               | --                              |
| clwbb1a              | 9459              | 6/23/2008 9:20   | Open water     | 13.0                  | 5.00                    | --                 | 7.60                               | 8.10                            |
| clwbb1a              | 9782              | 7/22/2008 9:45   | Open water     | 8.90                  | 0.09                    | --                 | 7.77                               | 9.70                            |
| clwbb1a              | 9836              | 8/5/2008 14:15   | Open water     | 11.1                  | 12.0                    | --                 | 7.35                               | 77.0                            |
| clwbb1a              | 9865              | 9/2/2008 10:30   | Open water     | 14.0                  | 11.5                    | --                 | --                                 | 7.90                            |
| clwbb1a              | 9885              | 8/20/2008 10:20  | Open water     | 11.1                  | 13.0                    | --                 | 7.30                               | 7.70                            |
| clwbb1a              | 9989              | 9/15/2008 10:20  | Open water     | 13.0                  | 12.0                    | --                 | 7.59                               | 8.10                            |

**Table 46.** Water quality, field measurements, and laboratory analyses – Clear Lake at Stebbins, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| clwbb1a              | 9405              | 5/19/2008 8:55   | 8.22                          | <0.9                | 3.40                 | 22.70              | 8.50                 | 23.50             |
| clwbb1a              | 9459              | 6/23/2008 9:20   | 7.90                          | <0.9                | 31.1                 | 237.4              | 367                  | 284.6             |
| clwbb1a              | 9782              | 7/22/2008 9:45   | 8.33                          | <0.9                | 40.1                 | 265.0              | 337                  | 287.0             |
| clwbb1a              | 9836              | 8/5/2008 14:15   | 8.50                          | <0.9                | 34.1                 | 280.7              | 360                  | 284.8             |
| clwbb1a              | 9865              | 9/2/2008 10:30   | 7.43                          | <0.9                | 30.0                 | 283.6              | 365                  | 290.0             |
| clwbb1a              | 9885              | 8/20/2008 10:20  | 8.11                          | <0.9                | 43.4                 | 283.6              | 360                  | 289.6             |
| clwbb1a              | 9989              | 9/15/2008 10:20  | 8.14                          | <0.9                | 33.9                 | 279.8              | 332                  | 286.2             |

**Table 46.** Water quality, field measurements, and laboratory analyses – Clear Lake at Stebbins, Alaska.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) | Ion Balance<br>(Percent) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|--------------------------|
| clwbb1a              | 9405              | 5/19/2008 8:55   | 69.30                            | 22.4                | 0.20E              | 1.00               | 6                        |
| clwbb1a              | 9459              | 6/23/2008 9:20   | 652.9                            | 219                 | <0.20              | 35.80              | 1                        |
| clwbb1a              | 9782              | 7/22/2008 9:45   | 661.3                            | 204                 | 0.60E              | 52.40              | 6                        |
| clwbb1a              | 9836              | 8/5/2008 14:15   | 679.5                            | 161                 | <0.20              | 66.8               | 7                        |
| clwbb1a              | 9865              | 9/2/2008 10:30   | 663.3                            | 163                 | <0.20              | 67.5               | 4                        |
| clwbb1a              | 9885              | 8/20/2008 10:20  | 656.1                            | 161                 | <0.20              | 67.2               | 5                        |
| clwbb1a              | 9989              | 9/15/2008 10:20  | 665.6                            | 160                 | <0.20              | 55.1               | 3                        |

**Table 46.** Water quality, field measurements, and laboratory analyses – Clear Lake at Stebbins, Alaska.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| clwbb1a                 | 9405                 | 5/19/2008 8:55   | 0.003                         | --   | --                                    | --                         | --                                      | --               | -122.7               | -15.65                |
| clwbb1a                 | 9459                 | 6/23/2008 9:20   | --                            | --   | --                                    | --                         | --                                      | --               | -85.89               | -10.37                |
| clwbb1a                 | 9782                 | 7/22/2008 9:45   | 0.010                         | 0.9  | 1.10                                  | n/a                        | n/a                                     | n/a              | -85.69               | -10.30                |
| clwbb1a                 | 9836                 | 8/5/2008 14:15   | 0.008                         | 0.8  | 1.00                                  | --                         | --                                      | --               | -85.63               | -10.41                |
| clwbb1a                 | 9865                 | 9/2/2008 10:30   | --                            | --   | --                                    | n/a                        | n/a                                     | n/a              | -88.00               | -10.10                |
| clwbb1a                 | 9885                 | 8/20/2008 10:20  | 0.007                         | 0.6  | 1.20                                  | --                         | --                                      | --               | -87.30               | -10.40                |
| clwbb1a                 | 9989                 | 9/15/2008 10:20  | 0.010                         | 0.9  | 1.10                                  | 520                        | 1,014                                   | 2.8              | -87.20               | -9.800                |

## Quality Assurance/Quality Control, 2006 – 2008

Tables 47 and 48 (located at the back of this report) report major ion results for standard water reference samples provided through participation in the U.S. Geological Survey Branch of Quality Assurance Program (<http://bqs.usgs.gov/srs/>). Results are reported for the number (n) of times a standard was analyzed within a water year. Measured values are compared to expected values for six constituents and accuracy is reported as a percent defined as the difference between the measured and expected value divided by the expected value multiplied by 100. Accuracy of the “M” series standards is considered acceptable if the percent difference is less than 10; for “P” series standards, less than 20 percent difference is considered acceptable. Of a total of 1,434 constituents measured in yearly averaged standards, 300 failed these criteria, or 21 percent of the total standard water reference sample quality-assurance measurements. Tables 49 and 50 (located at the back of this report) report the major ion results for laboratory blanks (deionized water). The expected values (EXP) are defined here as the instrument detection limit calculated from a statistical procedure adopted from Skogerboe and Grant (1970). Of the 1,184 constituents measured in the blanks, 140 were above the detection limits, or less than 12 percent of the total blank quality-assurance measurements. Table 51 (located at the back of this report) reports the results of six replicates collected in the field during the 2007 and 2008 water years. Field replicates are collected to assess variability due to site heterogeneity or inconsistencies in sampling protocol. Measured values are compared to expected values for 23 constituents and precision is reported as the relative percent difference (RPD) in concentration between the replicates divided by the mean multiplied by 100. Precision of the “M” series standards is considered acceptable if the percent difference is less than 10; for “P” series standards, less than 20 percent difference is considered acceptable. Replicate constituents with RPD less than 10 are considered acceptable. Of the 108 replicate constituents measured, 27 constituents had a relative percent difference greater than 10, demonstrating

that field collection methods were generally consistent and site heterogeneity was minimal. Table 52 (located at the back of this report) reports the instrument detection and quantitation limits for all constituents measured in the laboratory in tables 3-46 (located at the back of this report).

**Table 47.** Quality assurance/quality control based on standard reference water samples – Cations, 2006 – 2008.

[n, number of samples; AVG, average; measured, concentration measured by laboratory; SRWS, standard water reference samples; EXP, concentration expected; ACC, accuracy; Na, sodium; %, percent; K, potassium; Mg, magnesium; Ca, calcium; n/a, not available; all values in µg/L, microgram per liter]

| SRWS  | Water year | n  | AVG Na measured | EXP Na SRWS | AVG % ACC | AVG K measured | EXP K SRWS | AVG % ACC | AVG Mg measured | EXP Mg SRWS | AVG % ACC | AVG Ca measured | EXP Ca SRWS | % ACC |
|-------|------------|----|-----------------|-------------|-----------|----------------|------------|-----------|-----------------|-------------|-----------|-----------------|-------------|-------|
| M-90  | 2008       | 6  | 250.2           | 257.0       | -2.65     | 55.7           | 56.3       | -1.07     | 783.0           | 847.0       | -7.56     | 1,340           | 1,297       | 3.32  |
| M-110 | 2007       | 17 | n/a             | n/a         | n/a       | 111            | 102        | 8.82      | 1,435           | 1,662       | -13.7     | 2,347           | 3,643       | -35.6 |
| M-110 | 2008       | 18 | n/a             | n/a         | n/a       | 112            | 102        | 9.80      | 1,282           | 1,662       | -22.9     | 2,470           | 3,643       | -32.2 |
| M-156 | 2006       | 14 | 3,883           | 1,940       | 100       | 55.3           | 54.5       | 1.47      | 543.0           | 569.0       | -4.57     | 1,520           | 1,507       | 0.86  |
| M-156 | 2007       | 19 | 2,640           | 1,940       | 36.1      | 55.1           | 54.5       | 1.10      | 522.4           | 569.0       | -8.19     | 1,525           | 1,507       | 1.19  |
| M-156 | 2008       | 14 | 1,919           | 1,940       | -1.08     | 50.6           | 54.5       | -7.16     | 552.0           | 569.0       | -2.99     | 1,515           | 1,507       | 0.53  |
| M-164 | 2006       | 10 | 648.0           | 1,640       | -60.5     | 70.3           | 77.5       | -9.29     | 221.0           | 229.0       | -3.49     | 685.0           | 634.0       | 8.04  |
| M-164 | 2007       | 4  | 2,181           | 1,610       | 35.5      | 78.8           | 77.5       | 1.68      | 202.8           | 229.0       | -11.4     | 644.0           | 634.0       | 1.57  |
| M-164 | 2008       | 37 | 1,711           | 1,610       | 6.27      | 80.2           | 77.5       | 3.48      | 220.0           | 229.0       | -3.93     | 660.0           | 634.0       | 4.10  |

**Table 47.** Quality assurance/quality control based on standard water reference samples – Cations, 2006 – 2008.—Continued

| SRWS  | Water year | n  | AVG Na measured | EXP Na SRWS | AVG % ACC | AVG K measured | EXP K SRWS | AVG % ACC | AVG Mg measured | EXP Mg SRWS | AVG % ACC | AVG Ca measured | EXP Ca SRWS | AVG % ACC |
|-------|------------|----|-----------------|-------------|-----------|----------------|------------|-----------|-----------------|-------------|-----------|-----------------|-------------|-----------|
| M-184 | 2008       | 32 | 530             | 535         | -0.93     | 73.6           | 72.6       | 1.38      | 354             | 360         | -1.67     | 702             | 664         | 5.72      |
| P-23  | 2008       | 10 | 21.7            | 21.8        | -0.46     | 12.4           | 12.3       | 0.81      | 27.3            | 26.1        | 4.60      | 66.3            | 56.4        | 17.6      |
| P-28  | 2008       | 20 | 141             | 141         | 0.00      | 3.39           | 3.60       | -5.83     | 75.7            | 72.7        | 4.13      | 90.0            | 81.8        | 10.0      |
| P-31  | 2006       | 11 | 93.0            | 94.8        | -1.90     | 25.4           | 23.2       | 9.48      | 88.1            | 82.3        | 7.04      | 442             | 390         | 13.3      |
| P-31  | 2007       | 23 | 104             | 94.8        | 9.70      | 25.9           | 23.2       | 11.6      | 79.5            | 82.3        | -3.40     | 425             | 390         | 8.97      |
| P-31  | 2008       | 12 | 97.0            | 94.8        | 2.32      | 24.0           | 23.2       | 3.45      | 79.0            | 82.3        | -4.01     | 404             | 390         | 3.59      |
| P-39  | 2007       | 11 | 281             | 269         | 4.46      | 39.5           | 40.2       | -1.74     | 57.9            | 66.8        | -13.3     | 432             | 432         | 0         |
| P-39  | 2008       | 45 | 272             | 269         | 1.12      | 39.0           | 40.2       | -2.99     | 59.1            | 66.8        | -11.5     | 425             | 432         | -1.62     |
| P-48  | 2008       | 3  | 47.3            | 44.8        | 5.58      | 8.36           | 8.70       | -3.91     | 4.22            | 4.11        | 2.68      | 33.5            | 27.9        | 20.1      |

**Table 48.** Quality assurance/quality control based on standard reference water samples – Anions, 2006 – 2008.

[n, number of samples; AVG, average; measured, concentration measured in laboratory; SRWS, standard reference water sample; EXP concentration expected; ACC, accuracy; Cl, chloride; %, percent; SO<sub>4</sub>, sulfate; all values in µg/L, microgram per liter; n/a, not available]

| SRWS  | Water year | n  | AVG<br>Cl<br>measured | EXP<br>Cl<br>SRWS | AVG<br>%<br>ACC | AVG<br>SO <sub>4</sub><br>measured | EXP<br>SO <sub>4</sub><br>SRWS | AVG<br>%<br>ACC |
|-------|------------|----|-----------------------|-------------------|-----------------|------------------------------------|--------------------------------|-----------------|
| M-90  | 2008       | 9  | 133.0                 | 119.0             | 11.8            | 2,706                              | 2,498                          | 8.33            |
| M-110 | 2006       | 8  | n/a                   | n/a               | n/a             | 1,362                              | 1,332                          | 2.25            |
| M-110 | 2007       | 23 | n/a                   | n/a               | n/a             | 1,400                              | 1,332                          | 5.11            |
| M-110 | 2008       | 11 | n/a                   | n/a               | n/a             | 1,391                              | 1,332                          | 4.43            |
| M-156 | 2006       | 12 | 2,656                 | 1,825             | 45.5            | 875.0                              | 895.0                          | -2.23           |
| M-156 | 2008       | 25 | 2,104                 | 1,825             | 15.3            | 953.0                              | 895.0                          | 6.48            |
| M-164 | 2007       | 4  | 899.0                 | 654.0             | 37.5            | 220.3                              | 233.0                          | -5.45           |
| M-164 | 2008       | 9  | 832.0                 | 654.0             | 27.2            | 216.1                              | 233.0                          | -7.25           |
| P-17  | 2008       | 5  | 11.14                 | 11.70             | -4.79           | 10.24                              | 10.40                          | -1.54           |

**Table 48.** Quality assurance/quality control based on standard water reference samples – Anions, 2006 – 2008.—Continued

| Standard | Water year | n  | AVG<br>Cl<br>measured | EXP<br>Cl<br>SRWS | AVG<br>%<br>ACC | AVG<br>SO <sub>4</sub><br>measured | EXP<br>SO <sub>4</sub><br>SRWS | AVG<br>%<br>ACC |
|----------|------------|----|-----------------------|-------------------|-----------------|------------------------------------|--------------------------------|-----------------|
| P-23     | 2008       | 8  | 8.80                  | 8.70              | 1.15            | 27.1                               | 26.6                           | 1.88            |
| P-28     | 2008       | 13 | 105                   | 93.1              | 12.8            | 109                                | 128                            | -14.8           |
| P-31     | 2006       | 8  | 40.0                  | 38.9              | 2.83            | 102                                | 73.5                           | 38.8            |
| P-31     | 2007       | 24 | 40.3                  | 38.9              | 3.60            | 103                                | 73.5                           | 40.1            |
| P-31     | 2008       | 23 | 40.5                  | 38.9              | 4.11            | 90.4                               | 73.5                           | 22.9            |
| P-33     | 2008       | 11 | 78.9                  | 67.0              | 17.8            | 26.8                               | 29.0                           | -7.59           |
| P-36     | 2006       | 2  | 60.1                  | 58.4              | 2.91            | 588                                | 610                            | -3.61           |
| P-39     | 2007       | 10 | 59.2                  | 58.4              | 1.37            | 589                                | 610                            | -3.44           |
| P-39     | 2008       | 26 | 61.2                  | 58.4              | 4.79            | 679                                | 610                            | 11.3            |
| P-45     | 2008       | 3  | 10.8                  | 7.90              | 36.7            | 4.26                               | 5.20                           | -18.1           |
| P-48     | 2008       | 3  | 73.6                  | 72.2              | 1.94            | 4.93                               | 6.04                           | -18.4           |

**Table 49.** Quality assurance/quality control, laboratory blank – Cations, 2006 – 2008.

[n, number of samples; AVG, average; measured, concentration measured in laboratory ; EXP, expected concentration in laboratory blank; DIFF, difference; Na, sodium; %, percent; K, potassium; Mg, magnesium; Ca, calcium; n/a, not available; E, estimated; all values in µg/L, microgram per liter]

| Water year | n  | AVG Ca measured | Na EXP | AVG K measured | K EXP | AVG Mg measured | Mg EXP | AVG Ca measured | Ca EXP |
|------------|----|-----------------|--------|----------------|-------|-----------------|--------|-----------------|--------|
| 2006       | 59 | <0.50           | <0.50  | <0.20          | <0.20 | <1.00           | <1.00  | <0.60           | <0.60  |
| 2007       | 44 | <0.50           | <0.50  | <0.20          | <0.20 | 1.77E           | <1.00  | 9.42            | <0.60  |
| 2008       | 95 | <0.50           | <0.50  | <0.20          | <0.20 | <1.00           | <1.00  | 5.67            | <0.60  |

**Table 50.** Quality assurance/quality control, laboratory blank – Anions, 2006 – 2008.

[n, number of samples; AVG, average; measured, concentration measured in laboratory; EXP, expected concentration in laboratory; DIFF, difference; Cl, chloride; %, percent; SO<sub>4</sub>, sulfate; all values in µg/L, microgram per liter; n/a, not available]

| Water year | n  | AVG Cl measured | Cl EXP | AVG SO <sub>4</sub> measured | SO <sub>4</sub> EXP |
|------------|----|-----------------|--------|------------------------------|---------------------|
| 2006       | 67 | <0.80           | <0.80  | 2.30                         | <0.60               |
| 2007       | 50 | <0.80           | <0.80  | 0.88E                        | <0.60               |
| 2008       | 79 | 1.24E           | <0.80  | <0.60                        | <0.60               |

**Table 51.** Quality assurance/quality control, field replicates, 2007-2008.

[ YRITWC, Yukon River Inter-Tribal Watershed council; USGS, U.S. Geological Survey; ID, identification; DO, dissolved oxygen; mg/L, milligram per liter; <, less than detection limit; --, missing value or out of analytical range; µS/cm, microsiemen per centimeter at 25 degrees Celsius; °C, Celsius; UV, ultraviolet; SUVA, specific ultraviolet absorbance; nm, nanometer; µeq/L, microequivalents per liter; ppm, parts per million; δ <sup>2</sup> D, deuterium; δ <sup>18</sup> O, oxygen-18; n/a, not available, no sample collected; RPD, relative percent difference]

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| tanen1a              | 9238              | 7/20/2007 20:00  | Open water     | 23.8                  | 17.5                    | 9.39               | 7.53                               | 206                             |
| tanen1a              | 9241              | 7/20/2007 20:00  | Open water     | 23.9                  | 17.5                    | 9.39               | 7.66                               | 206                             |
| <b>RPD</b>           |                   |                  |                | <b>0.42</b>           | <b>0</b>                | <b>0</b>           | <b>1.72</b>                        | <b>0</b>                        |
| yubri1a              | 9240              | 7/22/2007 14:32  | Open water     | 28.9                  | 19.7                    | 9.49               | 7.59                               | 206                             |
| yubri1a              | 9241              | 7/22/2007 14:32  | Open water     | 28.9                  | 19.7                    | 9.49               | 7.70                               | 206                             |
| <b>RPD</b>           |                   |                  |                | <b>0</b>              | <b>0</b>                | <b>0</b>           | <b>1.44</b>                        | <b>0</b>                        |
| tanen1a              | 9154              | 3/30/2007 13:13  | Under ice      | 11.6                  | 0.00                    | 9.00               | 8.14                               | 171                             |
| tanen1a              | 9155              | 3/30/2007 13:30  | Under ice      | 11.0                  | -0.03                   | 12.0               | --                                 | 327                             |
| <b>RPD</b>           |                   |                  |                | <b>5.31</b>           | <b>200</b>              | <b>28.6</b>        | <b>n/a</b>                         | <b>1.20</b>                     |

**Table 51.** Quality assurance/quality control, field replicates, 2007-2008.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Sample<br>type | Air<br>temperature °C | Water<br>temperature °C | Field DO<br>(mg/L) | pH, laboratory<br>(Standard units) | Specific conductance<br>(µS/cm) |
|----------------------|-------------------|------------------|----------------|-----------------------|-------------------------|--------------------|------------------------------------|---------------------------------|
| yupqs1a              | 9912              | 8/11/2008 10:48  | Open water     | 15.6                  | 14.0                    | --                 | 7.95                               | 188.9                           |
| yupqs1a              | 9916              | 8/11/2008 11:21  | Open water     | 15.6                  | 14.0                    | --                 | 8.03                               | 189.0                           |
| <b>RPD</b>           |                   |                  |                | <b>0</b>              | <b>0</b>                | <b>n/a</b>         | <b>1.00</b>                        | <b>5.00</b>                     |
| yukot1a              | 9839              | 8/5/2008 18:00   | Open water     | --                    | 14.7                    | --                 | 7.86                               | 242                             |
| yukot1a              | 9840              | 8/5/2008 18:00   | Open water     | --                    | 14.7                    | --                 | 7.89                               | 242                             |
| <b>RPD</b>           |                   |                  |                | <b>n/a</b>            | <b>0</b>                | <b>n/a</b>         | <b>0.38</b>                        | <b>0</b>                        |
| yuea1a               | 9837              | 8/4/2008 15:35   | Open water     | 14.6                  | 13.4                    | 10.0               | 7.98                               | 228                             |
| yuea1a               | 9838              | 8/4/2008 18:20   | Open water     | 14.8                  | 13.5                    | 10.0               | 8.23                               | 228                             |
| <b>RPD</b>           |                   |                  |                | <b>1.36</b>           | <b>0.4</b>              | <b>0</b>           | <b>3.08</b>                        | <b>0</b>                        |

**Table 51.** Quality assurance/quality control, field replicates, 2007-2008.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| tanen1a              | 9238              | 7/20/2007 20:00  | 7.98                          | <0.9                | 39.1                 | 1,643              | 593.3                | 242.6             |
| tanen1a              | 9241              | 7/20/2007 20:00  | 7.98                          | <0.9                | 44.5                 | 1,620              | 492.4                | 206.1             |
| <b>RPD</b>           |                   |                  | <b>0</b>                      | <b>0</b>            | <b>12.9</b>          | <b>1.41</b>        | <b>18.6</b>          | <b>16.3</b>       |
| yubri1a              | 9240              | 7/22/2007 14:32  | 7.92                          | <0.9                | 31.7                 | 1,602              | 554.5                | 110.4             |
| yubri1a              | 9241              | 7/22/2007 14:32  | 7.92                          | <0.9                | 26.9                 | 1,604              | 595.3                | 121.4             |
| <b>RPD</b>           |                   |                  | <b>0</b>                      | <b>0</b>            | <b>16.4</b>          | <b>0.12</b>        | <b>7.10</b>          | <b>9.49</b>       |
| tanen1a              | 9154              | 3/30/2007 13:13  | 7.28                          | <0.9                | 54.2                 | 2,346              | 784.4                | 225.1             |
| tanen1a              | 9155              | 3/30/2007 13:30  | 7.37                          | --                  | --                   | --                 | --                   | --                |
| <b>RPD</b>           |                   |                  | <b>1.23</b>                   | <b>n/a</b>          | <b>n/a</b>           | <b>n/a</b>         | <b>n/a</b>           | <b>n/a</b>        |

**Table 51.** Quality assurance/quality control, field replicates, 2007-2008.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | pH, field<br>(Standard units) | Ammonium<br>(µeq/L) | Potassium<br>(µeq/L) | Calcium<br>(µeq/L) | Magnesium<br>(µeq/L) | Sodium<br>(µeq/L) |
|----------------------|-------------------|------------------|-------------------------------|---------------------|----------------------|--------------------|----------------------|-------------------|
| yupqsl a             | 9912              | 8/11/2008 10:48  | 7.93                          | <0.9                | 25.7                 | 1,721              | 706.9                | 306.0             |
| yupqsl a             | 9916              | 8/11/2008 11:21  | 7.93                          | <0.9                | 27.7                 | 1,739              | 737.0                | 324.0             |
| <b>RPD</b>           |                   |                  | <b>0</b>                      | <b>0</b>            | <b>7.49</b>          | <b>1.04</b>        | <b>4.17</b>          | <b>5.71</b>       |
| yukotl a             | 9839              | 8/5/2008 18:00   | 8.13                          | <0.9                | 22.9                 | 1,672              | 698.4                | 224.4             |
| yukotl a             | 9840              | 8/5/2008 18:00   | 8.13                          | --                  | --                   | --                 | --                   | --                |
| <b>RPD</b>           |                   |                  | <b>0</b>                      | <b>n/a</b>          | <b>n/a</b>           | <b>n/a</b>         | <b>n/a</b>           | <b>n/a</b>        |
| yuea a l a           | 9837              | 8/4/2008 15:35   | 8.30                          | <0.9                | 19.5                 | 1,559              | 717.6                | 221.5             |
| yuea a l a           | 9838              | 8/4/2008 18:20   | 8.32                          | <0.9                | 19.2                 | 1,565              | 722.8                | 227.1             |
| <b>RPD</b>           |                   |                  | <b>0.24</b>                   | <b>0</b>            | <b>1.55</b>          | <b>0.38</b>        | <b>0.72</b>          | <b>2.50</b>       |

**Table 51.** Quality assurance/quality control, field replicates, 2007-2008.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|
| tanen1a              | 9238              | 7/20/2007 20:00  | 1,471                            | 50.2                | 6.10               | 1,083              |
| tanen1a              | 9241              | 7/20/2007 20:00  | 1,438                            | 52.8                | 5.80               | 862                |
| <b>RPD</b>           |                   |                  | <b>2.27</b>                      | <b>5.05</b>         | <b>5.04</b>        | <b>22.7</b>        |
| yubri1a              | 9240              | 7/22/2007 14:32  | 1,491                            | 18.2                | 2.40               | 746.9              |
| yubri1a              | 9241              | 7/22/2007 14:32  | 1,489                            | 20.4                | 2.70               | 739.2              |
| <b>RPD</b>           |                   |                  | <b>0.13</b>                      | <b>11.4</b>         | <b>11.8</b>        | <b>1.04</b>        |
| tanen1a              | 9154              | 3/30/2007 13:13  | 2,534                            | 60.8                | 12.5               | 954.4              |
| tanen1a              | 9155              | 3/30/2007 13:30  | --                               | --                  | --                 | --                 |
| <b>RPD</b>           |                   |                  | <b>n/a</b>                       | <b>n/a</b>          | <b>n/a</b>         | <b>n/a</b>         |

**Table 51.** Quality assurance/quality control, field replicates, 2007-2008.—Continued

| YRITWC<br>Station ID | USGS<br>sample ID | Date<br>and time | Laboratory alkalinity<br>(µeq/L) | Chloride<br>(µeq/L) | Nitrate<br>(µeq/L) | Sulfate<br>(µeq/L) |
|----------------------|-------------------|------------------|----------------------------------|---------------------|--------------------|--------------------|
| yupqsl1a             | 9912              | 8/11/2008 10:48  | 1,652                            | 58.4                | 6.8                | 845.5              |
| yupqsl1a             | 9916              | 8/11/2008 11:21  | 1,704                            | 37.5                | 8.6                | 855.3              |
| <b>RPD</b>           |                   |                  | <b>3.10</b>                      | <b>43.6</b>         | <b>23.4</b>        | <b>1.15</b>        |
| yukot1a              | 9839              | 8/5/2008 18:00   | 1,613                            | 16.1                | 10.7               | 831.3              |
| yukot1a              | 9840              | 8/5/2008 18:00   | 1,609                            | --                  | --                 | --                 |
| <b>RPD</b>           |                   |                  | <b>0.25</b>                      | <b>n/a</b>          | <b>n/a</b>         | <b>n/a</b>         |
| yuea1a               | 9837              | 8/4/2008 15:35   | 1,663                            | 28.2                | 2.3                | 694.5              |
| yuea1a               | 9838              | 8/4/2008 18:20   | 1,657                            | 32.1                | 2.3                | 693.0              |
| <b>RPD</b>           |                   |                  | <b>0.36</b>                      | <b>13.9</b>         | <b>0</b>           | <b>0.22</b>        |

**Table 51.** Quality assurance/quality control, field replicates, 2007-2008.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA        | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>Inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|-------------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| tanen1a                 | 9238                 | 7/20/2007 20:00  | 0.075                         | 3.7         | 2.10                                  | 1,005                      | 1,655                                   | 9.7              | -170.1               | -22.03                |
| tanen1a                 | 9241                 | 7/20/2007 20:00  | 0.064                         | 1.6         | 4.00                                  | 968                        | 1,600                                   | 9.5              | -170.3               | -22.08                |
| <b>RPD</b>              |                      |                  | <b>15.8</b>                   | <b>79.2</b> | <b>62.3</b>                           | <b>3.75</b>                | <b>3.38</b>                             | <b>2.08</b>      | <b>0.12</b>          | <b>0.23</b>           |
| yubri1a                 | 9240                 | 7/22/2007 14:32  | 0.156                         | 2.9         | 5.40                                  | 1,109                      | 1,698                                   | 4.7              | -164.2               | -20.86                |
| yubri1a                 | 9241                 | 7/22/2007 14:32  | 0.152                         | 2.8         | 5.50                                  | 655                        | 1,730                                   | 5.4              | -163.3               | -20.93                |
| <b>RPD</b>              |                      |                  | <b>2.60</b>                   | <b>3.51</b> | <b>1.83</b>                           | <b>51.5</b>                | <b>1.87</b>                             | <b>13.9</b>      | <b>0.55</b>          | <b>0.34</b>           |
| tanen1a                 | 9154                 | 3/30/2007 13:13  | 0.022                         | 1.9         | 1.20                                  | 3,240                      | 3,251                                   | 54.6             | -168.1               | -21.81                |
| tanen1a                 | 9155                 | 3/30/2007 13:30  | 0.046                         | 1.9         | 2.50                                  | 3,215                      | 3,221                                   | 55.3             | --                   | --                    |
| <b>RPD</b>              |                      |                  | <b>70.6</b>                   | <b>0</b>    | <b>70.3</b>                           | <b>0.77</b>                | <b>0.93</b>                             | <b>1.27</b>      | <b>n/a</b>           | <b>n/a</b>            |

**Table 51.** Quality assurance/quality control, field replicates, 2007-2008.—Continued

| YRITWC<br>Station<br>ID | USGS<br>Sample<br>ID | Date<br>and time | UV<br>absorbance<br>at 254 nm | SUVA        | Dissolved<br>organic carbon<br>(mg/L) | Carbon<br>dioxide<br>(ppm) | Dissolved<br>Inorganic carbon<br>(mg/L) | Methane<br>(ppm) | $\delta^{2}\text{D}$ | $\delta^{18}\text{O}$ |
|-------------------------|----------------------|------------------|-------------------------------|-------------|---------------------------------------|----------------------------|-----------------------------------------|------------------|----------------------|-----------------------|
| yupqsla                 | 9912                 | 8/11/2008 10:48  | 0.223                         | 2.8         | 7.90                                  | --                         | 1,944                                   | 5.2              | --                   | --                    |
| yupqsla                 | 9916                 | 8/11/2008 11:21  | 0.225                         | 3.9         | 6.50                                  | --                         | 1,824                                   | 5.5              | --                   | --                    |
| <b>RPD</b>              |                      |                  | <b>0.83</b>                   | <b>32.8</b> | <b>19.4</b>                           | <b>n/a</b>                 | <b>6.37</b>                             | <b>5.61</b>      | <b>n/a</b>           | <b>n/a</b>            |
| yukotla                 | 9839                 | 8/5/2008 18:00   | 0.177                         | 3.1         | 5.70                                  | 1,141                      | 1,756                                   | 14.9             | -159.8               | -20.56                |
| yukotla                 | 9840                 | 8/5/2008 18:00   | 0.196                         | 3.9         | 5.00                                  | 957                        | 1,768                                   | 15.2             | -160.9               | -20.57                |
| <b>RPD</b>              |                      |                  | <b>10.2</b>                   | <b>22.9</b> | <b>13.1</b>                           | <b>17.5</b>                | <b>0.68</b>                             | <b>1.99</b>      | <b>0.69</b>          | <b>0.05</b>           |
| yueaala                 | 9837                 | 8/4/2008 15:35   | 0.148                         | 3.1         | 4.80                                  | 706                        | 1,709                                   | 5.9              | -164.6               | -21.17                |
| yueaala                 | 9838                 | 8/4/2008 18:20   | 0.160                         | 3.5         | 4.60                                  | 226                        | 1,730                                   | 8.1              | -165.6               | -21.19                |
| <b>RPD</b>              |                      |                  | <b>7.79</b>                   | <b>12.1</b> | <b>4.26</b>                           | <b>103</b>                 | <b>1.22</b>                             | <b>31.4</b>      | <b>0.61</b>          | <b>0.09</b>           |

**Table 52.** Quality assurance/quality control, detection and quantitation limits.

[µeq/L, microequivalents per liter; SUVA, specific ultraviolet absorbance; UV, ultraviolet;  $\delta^2\text{D}$ , deuterium;  $\delta^{18}\text{O}$ , oxygen-18; ppm, parts per million; n/a, Not available or not applicable; mg/L, milligrams per liter; \*, two-sigma standard deviation reported instead of detection limit]

| Constituent           | Detection Limit | Quantitation limit |
|-----------------------|-----------------|--------------------|
| Ammonium              | 0.9 ueq/L       | 8.0 µeq/L          |
| Potassium             | 0.2 ueq/L       | 1.0 µeq/L          |
| Calcium               | 0.6 ueq/L       | 2.0 µeq/L          |
| Magnesium             | 1.0 ueq/L       | 2.0 µeq/L          |
| Sodium                | 0.5 ueq/L       | 2.0 µeq/L          |
| Laboratory alkalinity | n/a             | n/a                |
| Chloride              | 0.8 ueq/L       | 2.8 µeq/L          |
| Nitrate               | 0.2 ueq/L       | 1.6 µeq/L          |
| Sulfate               | 0.6 ueq/L       | 2.1 µeq/L          |

**Table 52.** Quality assurance/quality control, detection and quantitation limits.—Continued

| Constituent                | Detection limit | Quantitation limit |
|----------------------------|-----------------|--------------------|
| UV absorbance              | 0.001           | n/a                |
| SUVA                       | n/a             | n/a                |
| Dissolved organic carbon   | 0.2 mg/L        | 0.7 mg/L           |
| Carbon dioxide             | 1 ppm           | n/a                |
| Dissolved inorganic carbon | n/a             | n/a                |
| Methane                    | 0.05 ppm        | n/a                |
| $\delta^2\text{D}$         | 2.0*            | n/a                |
| $\delta^{18}\text{O}$      | 0.2*            | n/a                |

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## References Cited

- Brabets, T.P., Wang, B., and Meade, R. H., 2000, Environmental and hydrologic overview of the Yukon River Basin, Alaska and Canada: U.S. Geological Survey Water-Resources Investigations Report 99-4204, 106 p. <http://pubs.er.usgs.gov/pubs/wri/wri994204>
- Brenton, R.W., and Arnett, T.L., 1993, Methods of analysis by the U.S. Geological Survey National Water Quality Laboratory – Determination of dissolved organic carbon by UV-promoted persulfate oxidation and infrared spectrometry: U.S. Geological Survey Open-File Report 92-480, 12 p.
- Chin, Y., Aiken, G., and O'Loughlin, E., 1994, Molecular weight, polydispersity and spectroscopic properties of aquatic humic substances: Environmental Science and Technology, v. 28, p. 1853-1858.
- Coplen, T., Wilman B., Joe D. and Chen, Julie 1991, Improvements in the gaseous hydrogen-water equilibration technique for hydrogen isotope-ratio analysis: Analytical Chemistry. v. 63 no. 9 p. 910-912, doi 10.1021/ac00009a014
- Dornblaser, Mark M., and Halm, Douglas R., eds., 2006, Water and Sediment Quality of the Yukon River and its Tributaries, from Eagle to St. Marys, Alaska, 2002–2003, U.S. Geological Survey Open-File Report 2006-1228, 202 p.

Epstein, S., and Mayeda, T., 1953, Variation of O<sup>18</sup> content of waters from natural sources: *Geochimica et Cosmochimica Acta*, v. 4, p. 213-224.

Fishman, M.J., and Friedman, L.C., 1989, Methods for determination of inorganic substances in water and fluvial sediments: *U.S. Geological Survey Techniques of Water-Resources Investigations*, book 5, chap. A1, 545 p.

Fishman, M.J., 1993, Methods of analysis by the U.S. Geological Survey National Water Quality Laboratory – Determination of inorganic and organic constituents in water and fluvial sediments: *U.S. Geological Survey Open-File Report 93-125*, 217 p.

Halm, D.R., and Dornblaser, M.M., 2007, Water and sediment quality in the Yukon River and its tributaries between Atlin, British Columbia, Canada, and Eagle, Alaska, USA, 2004: *U.S. Geological Survey Open-File Report 2007-1197*, 120 p.

Hinzman and others, 2005, Evidence and implications of recent climate change in Northern Alaska and other Arctic regions: *Climatic Change*, v. 72, no. 3, p. 251–298.

Jorgenson, M.T., Shur, Y.L., Pullman, E.R., 2006, Abrupt increase in permafrost degradation in Arctic Alaska: *Geophysical Research Letters*, v. 33, no. 2, 4 p.

Kane, E.S., Harden, J.W., Kasischke, E.S., Turetsky, M.R. and Manies, K.L., 2006, Soil drainage and topographic influences on wildfire consumption of soil organic carbon in boreal forests: implications

for carbon stability: Eos, Transactions, American Geophysical Union, v. 8, no. 52, Fall Meeting Supplement, Abstract B21A-1011.

Schuster, P.F., 2003, Water and sediment quality in the Yukon River Basin, Alaska, during water year 2001: U.S. Geological Survey Open-file Report 03-427, 120 p.  
*<http://water.usgs.gov/pubs/of/2003/ofr03427/>*

Schuster, P.F., 2005, Water and sediment quality in the Yukon River Basin, Alaska, during water year 2002: U.S. Geological Survey Open-File Report 2005-1199, 82 p.  
*<http://pubs.usgs.gov/of/2005/1199/>*

Schuster, P.F., 2005, Water and sediment quality in the Yukon River Basin, Alaska, during water year 2003: U.S. Geological Survey Open-File Report 2005-1397, 74 p.  
*<http://pubs.usgs.gov/of/2005/1397/>*

Schuster, P.F., 2006, Water and sediment quality in the Yukon River Basin, Alaska, during water year 2004: U.S. Geological Survey Open-File Report 2006-1258, 67 p.  
*<http://pubs.usgs.gov/of/2006/1258/>*

Schuster, P.F., 2007, Water and sediment quality in the Yukon River Basin, Alaska, during water year 2005: U.S. Geological Survey Open-File Report 2007-1037, 65 p.  
*<http://pubs.usgs.gov/of/2007/1037/>*

Skogerboe, R.K., and Grant, C.L., 1970, Comments on the definitions of terms sensitivity and detection limit: Spectroscopy Letters, v. 3, p. 215-219.

Striegl, R.G., and Michmerhuizen, C.M., 1998, Hydrologic influence on methane and carbon dioxide dynamics at two north-central Minnesota lakes: Limnology and Oceanography, v. 43, no. 7, p. 1519-1529.

Striegl, R.G., Kortelainen, P., Chanton, J.P., Wickland, K.P., Bugna, G.C., and Rantakari, M., 2001, Carbon dioxide partial pressure and  $^{13}\text{C}$  content of north temperate and boreal lakes at spring ice melt: Limnology and Oceanography, v. 46, no. 4, p. 941-945.

Striegl, R.G., Aiken, G.R., Dornblaser, M.M., Raymond, P.A., Wickland, K.P., 2005, A decrease in discharge-normalized DOC export by the Yukon River during summer through autumn: Geophysical Research Letters, v. 32, L21413.

Striegl, R.G., Dornblaser, M.M., Aiken, G.R., Wickland, K.P., and Raymond, P.A., 2007, Carbon export and cycling by the Yukon, Tanana, and Porcupine Rivers, Alaska, 2001-2005: Water Resources Research, v 43, W02411, doi:10.1029/2006WR005201, 9 p.

U.S. Geological Survey, variously dated, National field manual for the collection of water-quality data: U.S. Geological Survey Techniques of Water-Resources Investigations, book 9, chaps, A1-A9, 2 v., variously paged. [Chapters were published from 1997-1999; updates and revisions are ongoing and can be viewed at: <http://water.usgs.gov/owq/FieldManual/mastererrata.html>]

Walvoord, M.A. and Striegl, R.G., 2007, Increased groundwater to stream discharge from permafrost thawing in the Yukon River Basin: Potential impacts on lateral export of carbon and nitrogen: Geophysical Research Letters, v. 34, L12402.

**Figure 1.** Location of Yukon River Inter-Tribal Watershed Council (YRITWC) and U.S. Geological Survey (USGS) water-quality monitoring stations in the Yukon River Basin.

