



**Alaska Department of Environmental Conservation  
Waterbody Determination Paper  
Little Susitna River, Alaska  
Total Aromatic Hydrocarbons Attainment**

## Category Recommendation

**Waterbody Name:** Little Susitna River

**Category Change:** 4b to 2

**Water Quality Standard Affected:** Petroleum Hydrocarbons, Oils and Grease for fresh water uses

**Designated Uses Affected:** (A) Waters Supply (iii) aquaculture, growth and propagation of fish, shellfish, other aquatic life, and wildlife; (C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife

**Pollutant:** total aromatic hydrocarbons

## Executive Summary

This document describes the data analysis and conclusions reached in evaluating lower Little Susitna River Total Aromatic Hydrocarbons (TAH) for the 2022 Integrated Water Quality Monitoring and Assessment Report (Integrated Report). The lower Little Susitna River was included in Category 4b in the 2014/16 Integrated Report. Since then, multiple activities have occurred to reduce TAH levels in the river. Water quality data from 2019 – 2020 demonstrate the controls are effective. The Alaska Department of Environmental Conservation (DEC) recommends moving Little Susitna River from Category 4b to Category 2 for Petroleum Hydrocarbons, Oils, and Grease.

## Basic Waterbody Information

*Table 1. Basic waterbody information*

<b>Assessment Unit ID</b>	AK_R_2050512_016_003
<b>Assessment Unit Name</b>	Little Susitna River
<b>Location Description</b>	Lower Little Susitna River upstream and downstream of public use facility boat launch; HUC10 1902050512
<b>Water Type</b>	Fresh water
<b>Area Attaining</b>	The original impaired area of 8.5 miles from river mile 17.5 to river mile 26 (from approximately 7.5 miles downstream of the Little Susitna River Public Use Facility to 0.7 miles upstream of the facility)
<b>Time Attaining</b>	August (original impairment)

<b>Latitude, Longitude</b>	61.4379, -150.1749
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## Pollutant Status

*Table 2. Alaska’s Water Quality Standards at 18 AAC 70 (5) Petroleum Hydrocarbons, Oils and Grease for fresh water uses<sup>1</sup>*

<b>Designated Use Class</b>	<b>Use Subclass</b>	<b>Criteria</b>
(A) Water Supply	(i) drinking, culinary and food processing	May not cause a visible sheen upon the surface of the water. May not exceed concentrations that individually or in combination impart odor or taste as determined by organoleptic tests.
	(ii) agriculture, including agriculture and stock watering	May not cause a visible sheen upon the surface of the water
	(iii) aquaculture	Total aqueous hydrocarbons (TAqH) in the water column may not exceed 15 µg/l (see note 7 <sup>2</sup> ). Total aromatic hydrocarbons (TAH) in the water column may not exceed 10 µg/l (see note 7). There may be no concentrations of petroleum hydrocarbons, animal fats, or vegetable oils in shoreline or bottom sediments that cause deleterious effects to aquatic life. Surface waters and adjoining shorelines must be virtually free from floating oil, film, sheen, or discoloration.
	(iv) industrial	May not make the water unfit or unsafe for the use
(B) Water Recreation	(i) contact recreation	May not cause a film, sheen, or discoloration on the surface or floor of the waterbody or adjoining shorelines. Surface waters must be virtually free from floating oils.
	(ii) secondary recreation	Same as (5)(B)(i)
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife		Same as (5)(A)(iii)

<sup>1</sup> Alaska Department of Environmental Conservation (DEC). 2020. 18 AAC 70.010 Water Quality Standards. Amended as of March 5, 2020.

<sup>2</sup> Samples to determine concentrations of TAH and total aqueous hydrocarbons (TAqH) must be collected in marine and fresh waters below the surface and away from any observable sheen; concentrations of TAqH must be determined and summed using a combination of: (A) EPA Method 602 (plusxylenes) or EPA Method 624 to quantify monoaromatic hydrocarbons and to measure TAH; and (B) EPA Method 610 or EPA Method 625 to quantify polynuclear aromatic hydrocarbons listed in EPA Method 610; use of alternative method requires department approval; the EPA methods referred to in this note may be found in Appendix A of 40 C.F.R. 136, Appendix A, as revised as of July 1, 2003 and adopted by reference.

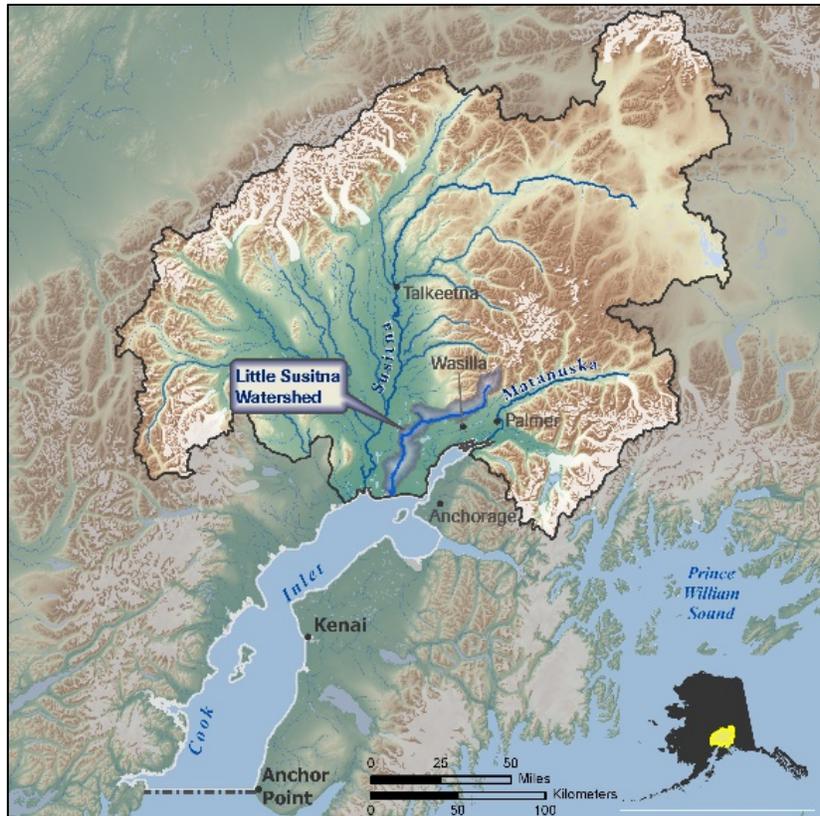
## Attainment Evaluation

### Background

The Little Susitna River flows over 113 miles from the Talkeetna Mountains to Cook Inlet near Anchorage in southcentral Alaska (Figure 1). The river supports a popular salmon sport fishery and is a popular recreation area. The river is easily accessible by road, resulting in heavy use by anglers during the summer. The Little Susitna River Public Use Facility (PUF) boat launch located approximately 25 miles upstream from Cook Inlet is the primary motorized boat access point to the lower Little Susitna River.

Concentrated motorized boat use on the lower Little Susitna River during the summer raised public and state agency concern over potential changes in water quality and effects to aquatic life, including salmon. In response to these concerns, DEC initiated water quality studies from 2007 to 2011. DEC conducted additional studies in the summers of 2012 and 2014. Data showed that the lower Little Susitna River experienced TAH concentrations that exceeded impairment thresholds,<sup>3</sup> where the 96-hour average of TAH exceeds the 10 micrograms per liter ( $\mu\text{g/L}$ )

criteria more than once in a 3-year period. Table 2 describes water quality uses and associated criteria. As a result of elevated TAH concentrations, DEC designated an 8.5-mile segment of the Little Susitna River (Table 1), as impaired for the month of August and placed it in Category 4b



*Figure 1. The Little Susitna River watershed in southcentral Alaska. Source: EPA, Nonpoint source success story, Educating boaters and restricting use of older boat motors reduces hydrocarbon pollution in the Little Susitna River, 2021.*

<sup>3</sup> DEC. 2015. Listing methodology for determining water quality impairments from petroleum hydrocarbons, oils and grease. Final Guidance. December 14, 2015. Juneau, Alaska.

in Alaska's 2014/2016 Integrated Report. The source was listed as petroleum hydrocarbon pollution from motorized boat activity.

### Actions Implemented

From 2010 to 2017, DEC and community partners coordinated the *Clean Boating on Little Su* public outreach campaign. Project partners added clean boating signage at the Little Susitna River PUF, conducted one-on-one conversations with people using the boat launch, advertised clean boating tips via radio and print media, and hosted educational booths at local and regional boat and outdoors shows. Clean boating kits, which included an oil absorbent pad, a magnet with clean fueling tips, brochures on clean bilges/spill response/ clean oil changes, and a clean boating fishing license holder containing a card of clean boating practices were also distributed.

In addition, the Alaska Board of Fisheries implemented a new regulation effective January 2017 that prohibits fishing from a motorized boat on the Little Susitna River unless a four-stroke motor or a direct-fuel-injected two-stroke motor is used (5 AAC 60.122(a)(9)(L)). This regulation is implemented by the Alaska Department of Fish and Game. The Little Susitna River PUF has a restricted access point with a staffed entrance booth. This design helps to regulate boat motor types being launched on the river. Signage placed at the boat launch reminds boaters of the regulation and the penalty of \$100 for noncompliance.

### Results

DEC conducted follow-up water quality sampling in the lower Little Susitna River in August 2019 and 2020. None of the 80 samples collected in 2019 and 2020 exceeded the TAH Water Supply use criteria of 10 µg/L. The maximum TAH concentration measured was 6.41 µg/L in 2019 and 8.60 µg/L in 2020 (Table 3). The 96-hour average concentrations were also below criteria (Table 4) and were less than expected based on the number of motorized boats operating. This suggests that the current regulation limiting the use of two-stroke motors and the *Clean Boating on Little Su* public outreach campaign have been effective at reducing TAH concentrations. As a result of these water quality improvements, the Little Susitna River now is meeting Water Quality Standards.

*Table 3. August TAH values in the Little Susitna River 2010 - 2020 <sup>4</sup>*

<b>Sampling Period</b>	<b>Total Number Samples</b>	<b>Maximum Value (µg/L)</b>	<b>Samples Exceeding Criteria (10 µg/L)</b>
August 2010	40	30.40	14
August 2014	285	38.72	51
August 2019	40	6.41	0
August 2020	40	8.60	0

*Table 4. Daily average and 96-hour TAH values in the Little Susitna River (August 2019 – 2020)*

<b>Date</b>	<b>Daily Average TAH (µg/L)</b>	<b>96-hour TAH (µg/L)</b>
8/9/2019	2.62	2.66
8/10/2019	5.51	
8/11/2019	2.48	
8/12/2019	2.80	
8/6/2020	2.20	3.20
8/7/2020	3.11	
8/8/2020	4.02	
8/9/2020	3.47	

## Conclusion

DEC recommends moving Little Susitna River from Category 4b to Category 2 in the 2022 Integrated Report as it is now consistently meeting the Petroleum Hydrocarbons, Oils and Grease standard.

<sup>4</sup> Little Susitna River Category 4b water quality impairment for total aromatic hydrocarbons. DEC. February 5, 2018. 2014/16 Integrated Report for 2010 and 2014 data details